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Foreign AGRICULTURE

A REVIEW OF FOREIGN FARM POLICY, PRODUCTION, AND TRADE

APRIL 1942

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THE AGRICULTURE OF JAMAICA . . . . .

By Kathryn H. Wylie*

The economy of Jamaica depends almost entirely upon its agricultural resources. Bananas and sugar are produced for export and cassava and coconuts for home use, but the island's agriculture does not provide all the food requirements of the growing population. Government agencies emphasize the need for greater self-sufficiency. The general scale of living is relatively low; and the peacetime production of the leading commodities usually does not require all of the labor available. The war has changed the relative importance of the leading crops and has advanced the position of North America in the foreign trade of Jamaica. The war also is focusing the attention of the United States on Jamaica and other Caribbean islands because of their importance in plans for the protection of the Western Hemisphere.

THE PEOPLE AND THEIR SETTING

Because much of the land of Jamaica is too rugged to cultivate, the people crowd into a relatively small area. In December 1940 there were about 1,218,000 people living in Jamaica, most of them in the level valleys. The birth rate is high, 32 per thousand in 1938 compared with 17.6 in the United States. The death rate is also high, 16.3 compared with 10.6 in the United States, but the net increase in the population is still large - alarmingly so, in view of the island's limited productive capacity. Three-quarters of the people in Jamaica are Negroes, 18 percent are mulattoes, and 2 percent are East Indians. Fewer than 2 percent are white, but English is spoken almost exclusively.

Sugar refining, rum distilling, tobacco manufacturing, and processing of other agricultural products are the only industries in Jamaica, other than agriculture itself, which must supply employment for most of the workers. The demand for Jamaican labor in Central America and the other West Indian islands has declined, partly because of the agricultural depression and partly because many of these countries now restrict the immigration of such laborers. Unemployment has been serious and the standard of living low. There is no actual starvation, but diets are inadequate and malnutrition is the most prevalent defect among school children.

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Jamaica is the largest foreign-owned island in the Caribbean Sea. It is 90 miles south of the eastern end of Cuba and 594 miles north of the Panama Canal (fig. 1). The island covers 4,450 square miles, is 144 miles long, and varies in width from 21½ to 49 miles. Its dependencies, the Cayman, Turks, and Caicos Islands and Pedro and Morant Cays, cover 84 square miles.

Mountains run the length of the island. The high central range breaks in every direction into numerous subsidiary ridges to produce a rugged landscape. Half the total area is more than 1,000 feet high; Blue Mountain Western Peak is 7,388 feet above the sea.

Many rivers flow in the deep ravines between the steep slopes, but few are navigable. The aboriginal name of Xaymaca, from which Jamaica is derived, means "overflowing abundance of rivers." There is considerable potential water power, but little has been done to develop it. Rainfall averages 74 inches a year. The northeastern section receives almost 100 inches, but the southern part, shut off from the northeasterly winds, receives only 43 inches a year. Rain is heaviest from May to October. Jamaica is in the hurricane zone and has experienced destructive winds on an average of once every 12 years.

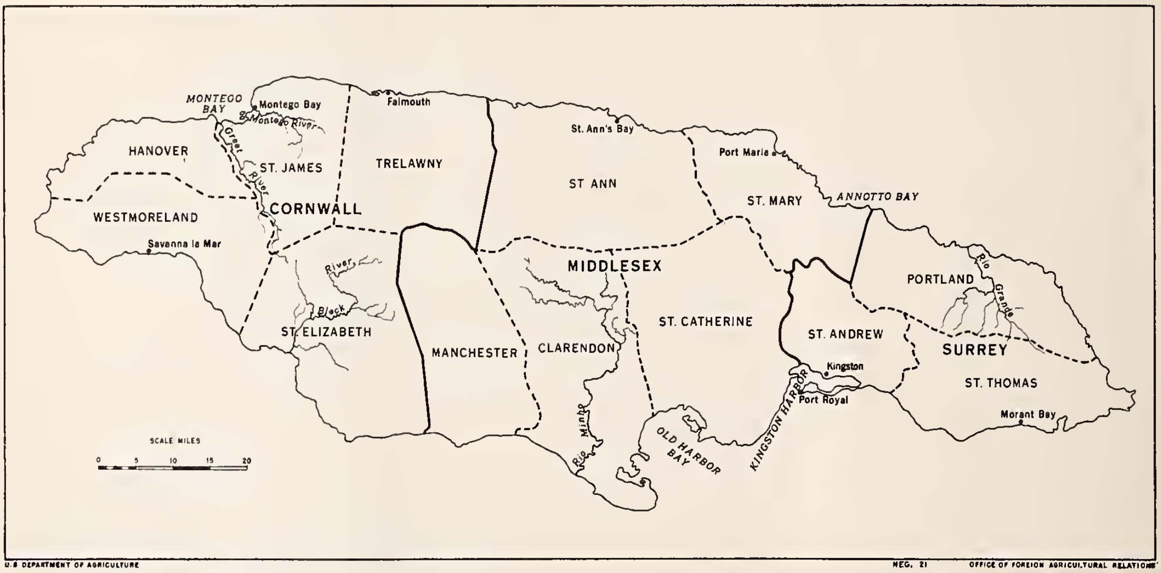

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FIGURE 1.—Outline map of Jamaica.

Most of the island is of white and yellow limestone formation. The white limestone plateau, which surrounds the central mountain range, covers almost three-fourths of the island. Soil accumulation on the plateau has been irregular and is fit only for small peasant cultivation or rocky pasture. Several plains and valleys, notably the Liguanea, St. Catherine, and Lower Clarendon Plains, the Westmoreland and Trelawny Basin Valleys, and the Montego Bay flats, have alluvial and residual deposits of good depth. The soils vary in fertility, friability, composition, and color, some being suited for sugar and banana cultivation, and others for citrus and tobacco.

The variation in elevation from sea level to 7,000 feet causes a considerable range of temperatures of slight seasonal variation. The coast country around Kingston, the hottest part of the island, has a mean annual temperature of 78.7° F., and a range of about 10° from the average. The climate is cooler at the higher elevations, the mean annual temperature on the mountaintops being 55° to 60°. Average temperatures between 1,000 and 3,000 feet elevation, where the population is concentrated, range from 68.7° to 75.7°.

TRANSPORTATION AND COMMUNICATION

The excellent transportation and communication facilities include over 200 miles of line operated by the Jamaica Government Railway and 2,400 miles of hard-surface roads serving the principal towns. More than 4,400 miles of branch roads connect the larger centers with most interior points. Telephone and telegraph service is available throughout the interior, and cables connect with New York, London, and the other Caribbean islands.

Steamships of Netherland, German, and British registry carried passengers and freight across the Atlantic before the war, and United States and Canadian ships carried the traffic with North America. Only British, Canadian, and United States ships now operate. It is increasingly difficult to find shipping space for island products, particularly to the British market. The harbor at Kingston can accommodate large ships. Many other harbors offer possibilities for the development of seaplane bases.

The Pan American Airways operates mail service between Jamaica and North and South America. Mail planes for Jamaica make connections for the Orient and Europe.

HISTORICAL DEVELOPMENT

The history of Jamaica is a story of sugar plantations, slave traders, buccaneers, and rum; of ginger and allspice and hurricanes; of tourists and bananas. Columbus discovered the island in 1494, and his son, Diego, directed the first settlement 15 years later. The Spanish continued to rule until 1655, when a force sent by Cromwell conquered the island and brought it into the British Empire.

The island is now administered by a Governor and a Council, 10 members appointed by the British Crown and 14 elected by the people. There are 3 counties and 14 parishes. The parish is the local unit of government, managed by an elected board. Natives are prominent in all branches of the government service.

The sugar industry and the slave trade flourished in colonial days, and Jamaica became the center of a profitable three-cornered trade with Africa, Britain, and North America. Ships from Britain and North America took rum and other goods to barter for slaves in Africa; shippers traded the slaves in the West Indies for sugar for the homeland and the other colonies.

British settlers wanted to stay in Jamaica only long enough to get rich by selling sugar to England. They developed a system of large plantation agriculture based on the labor of their slaves. Small sugar holdings could not compete and soon disappeared. Many other small plantations were swallowed up as sugar acreage expanded.

Jamaica purchased most of its needed food from the North American colonies and put most of its agricultural land into the more profitable sugarcane. The fortunes of the large plantation owners rose with the price of sugar during the seventeenth century and fell with it during the eighteenth. Jamaica was not so dependent on imported food as were the other British islands, but the Government, recognizing the dangers of one-crop agriculture, established the botanic gardens and offered prizes and medals for diversification. These efforts, however, were not successful, and sugar remained the quickest way to wealth. Smaller plantations produced cacao, coffee, cotton, indigo, allspice, and ginger. These together occupied only 181,000 acres in 1818 compared with 280,000 acres of grazing land and 639,000 acres in sugarcane.

Early British commercial policy was partly responsible for the failure to diversify crops for export. For example, Jamaican planters developed a substantial indigo industry in the last half of the seventeenth century, and exports to England during 1763-67 averaged 43,041 pounds. A new parliamentary tax, however, discouraged the planters, and during 1815-19 exports to England were less than one-third of the previous level. Duties and excise taxes on coffee in England were about five times its sale value. When they were considerably reduced in 1825, coffee production was stimulated greatly, and exports to England jumped from an average of 37,180 pounds during 1763-67 to 15,229,960 during 1815-19.

Early in the nineteenth century the economic position of Jamaican sugar began to decline sharply. Sugar prices in the French West Indies were lower than in the British possessions. Sales of food and slaves to Jamaica were made more and more for cash and the money used to buy sugar in the French islands. British settlers and absentee landlords began to feel the effects of this competition. The slaves were freed in 1807, sugar prices began a downward spiral, and the resulting depression produced a grave crisis. Because the agents of absentee landlords were interested primarily in immediate profits, they exhausted the soil, used antiquated production methods, and allowed buildings to fall apart. Land values began to decline, and many plantations were lost to creditors. Large holdings were broken up, and the cultivation of crops other than sugar increased. Bananas and coffee were the most important of these, banana cultivation spreading rapidly throughout the island.

Subsistence farming grew faster in Jamaica than in the other islands during the latter half of the nineteenth century. Small farmers also raised coffee to exchange for their clothing and other needs. The government aided the small farmer to buy his farm, and these small plots now provide a living for about half the population.

AGRICULTURE

Agriculture offers practically the only employment for the ever-increasing labor force, aside from a few small factories manufacturing consumer goods from agricultural raw materials. Seventy-five percent of those employed in the island work directly in agriculture. Bananas have accounted for more than 50 percent of the total value of all exports, chiefly agricultural, and sugar for another 15 to 18 percent. Manufactured and semimanufactured exports represent only 5 percent of the total, and they are principally rum and cigars.

Sugar from Jamaica furnished from one-third to two-thirds of the British market supplies in 1700, but the 100,000 tons a year sent to England before the present war accounted for only 1 percent of total imports. Jamaica has had a monopoly on bananas in the British market since the Ottawa Imperial Conference of 1932 and ranked first as a world supplier in 1938, furnishing 15 percent of world exports.

Land Distribution

The rugged topography characteristic of the island limits the land area fit for cultivation. Level land is estimated at only 14.5 percent of the total area. Crops such as coffee and cacao, however, thrive on the warm hillsides. The tax returns show about 12 percent of the total area under cultivation and 21.1 percent in grazing land (fig. 2). In the United States about 20 percent of the total area is cultivated, although in the agricultural States of Iowa and Illinois as much as 34 to 36 percent is under cultivation.

The banana- and coconut-producing parish of St. Mary has the largest cultivated area, both in number of acres and in percentage of total land. Considerable expansion in agricultural production is possible. Additional land could be tilled and that already in use cultivated more effectively.

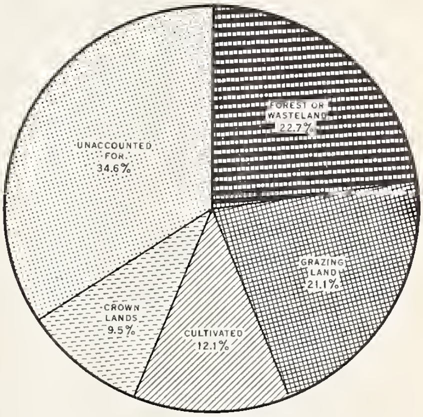

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FIGURE 2.-Land distribution in Jamaica.

Organization

The number of small farms is increasing. Half the owners were on farms ranging in size from one-half to 5 acres in 1930, and by 1938 the proportion had risen to 84 percent. Much of the land, however, is still held in large blocks - 146 persons owning 21 percent of the total in 1938 (with an average holding of 3,196 acres) and less than 1 percent of the owners holding 64 percent of all the land (data from tax returns).

TABLE 1.-*Taxable holdings in Jamaica, April 1, 1938*[1]

SIZE OF HOLDING	OWNERS		ACREAGE		VALUE	
	Number	*Percent*	*Acres*	*Percent*	*1,000 dollars*	*Percent*
Under 5 acres (Av. 1.4 acres)	198,456	83.6	281,723	12.9	49,455	57.9
5 to 49 acres (Av. 11.6 acres)	35,812	15.1	415,359	19.0	11,133	13.0
50 to 99 acres (Av. 70.8 acres)	1,107	0.5	78,377	3.6	1,775	2.1
100 to 499 acres (Av. 227.7 acres)	1,223	0.5	278,542	12.8	5,061	5.9
500 to 999 acres (Av. 723.2 acres)	392	0.1	283,507	13.0	4,919	5.8
1,000 to 1,999 acres (Av. 1,407.5 acres)	269	0.1	378,629	17.3	6,107	7.1
2,000 acres and over (Av. 3,195.6 acres)	146	0.1	466,552	21.4	7,051	8.2
Total .(Av. 9.2)	237,405	100.0	2,182,689	100.0	85,501	100.0

[1] Annual General Report of Jamaica.

Generally coffee growers have small farms, with coffee trees on only a few acres. The largest area in coffee on a single farm is less than 200 acres, and most farms have under 50, with the rest in pasture, woods, and wasteland. Average cacao acreage is even smaller, individual plantings varying from 1 to 150 acres. Bananas are produced by both large and small farmers. A few large producers, notably the fruit companies, raise most of the commercial crop, although many banana farmers cultivate less than 50 acres. Most of the sugarcane acreage is on large factory-owned farms.

Labor is abundant, and population increases more rapidly than do employment opportunities. The hardships of unemployment have fostered labor disturbances, particularly since 1937. Trade unionism is progressing slowly. The Bustamente Trade Unions, established in 1938, include agricultural laborers. The Jamaica Trades Union Council, formed in February 1939, is now coordinating the work of all unions, and the New People's National Party is giving political strength to labor.

The average weekly wage for agricultural labor in 1938 was $2.82 for 50 hours of work. A war allowance to workers, granted July 1, 1940, amounted to 2.5 cents on each 20 cents for those earning between 60 cents and $1.20 a day, and 3.4 cents on each 20 cents for those earning less than 60 cents a day. The allowance was raised by 1.7 cents in March 1940. The Minimum Wage Board is making an investigation to serve as the basis for linking wages to the cost of living, which has been rising rapidly since the war started. The index of the cost of living increased 40 percent between August 1939 and August 1941, and clothing went up 105 percent.

Between 100,000 and 150,000 small farmers - more than half the families - make all or part of their living from their own small plot. The other laborers work (when they can get a job) on the sugar and banana plantations, in the small factories processing agricultural products, or on the docks.

Government Policies

Both the Imperial Government and the local government have regulated agriculture as well as other island activities. The war is intensifying control and regulation. The local government provided for inspection of all exports in the Agricultural Produce Law of 1926 and for the control of plant and animal diseases through the Protection from Disease Law of 1925. The Agricultural Development Board, set up in 1935, considers and reports on all agricultural developments in an effort to improve and encourage all branches of the industry.

The government is anxious to encourage the settlement of farmers on small holdings and has made grants of land and money for this purpose. The Central Lands Advisory Board, reconstituted in 1938, advises the government on land-settlement schemes and recommends action to the Land Settlement Commission.

The Department of Science and Agriculture is responsible for experimental and extension work in agriculture and supervises the botanical gardens, the experiment station, the Jamaica School of Agriculture, the government stock farm, the government stud farm and experiment stations, research laboratories, the Low Temperature and Marketing Station, and the field service. The gardens do valuable work in propagating plants and distributing them throughout the island and in improving the varieties of cane. Special assistance has been given to individual industries, particularly sugar, bananas, citrus, and coconuts.

Direct aid and regulation through legislation and government boards have been supplemented by semiofficial organizations, such as the Jamaica Agricultural Society, established in 1895. It encourages improved cultivation and breeding and offers prizes for new cultivation. The Jamaica Producers' Association, established in 1927, is a farmers' cooperative organization. The association received government assistance and in turn established subsidiary marketing organizations, the most important of which is the Jamaica Banana Producers' Association.

Soon after the war started in 1939, the government issued wartime-control legislation authorizing strict regulation of all commerce and industry. The local government controls export trade under instructions from London. Exports are prohibited except under license for all products except bananas. Strict control of imports tends to encourage local production of foodstuffs, and local legislation requiring use of domestic products has the same effect. Prohibition of imports into the United Kingdom of bananas, copra, and rum and quotas on many other products also work in that direction. Both wholesale and retail prices of foodstuffs, hardware, and drygoods are fixed.

The main objectives of agricultural policy now are:

(1) To provide adequate food supplyby encouraging increased production of grains and other crops already grown in the island, improving food crops by revising the cultural methods and introducing new plant varieties, and improving the standard of livestock farming.

(2) To aid the main industries of the colony - sugar and banana production - in cultivation and in pest and disease control.

(3) To encourage production of additional crops - tree and minor fruits and vegetables.

(4) To maintain the standard of the colony's agricultural exports by a rigid system of inspection.

(5) To quarantine and inspect imported plants and animals to prevent the spread of disease.

(6) To conserve the soil by a program of reforestation of steep slopes, protection of forest reserves, and proper antierosion practices.

(7) To educate farmers, in cooperation with the Jamaica Agricultural Society.

(8) To carry on fundamental research already started.

Crop Pattern

Large plantation agriculture is typical, but small farms are growing in importance. Sugarcane and bananas now occupy one-half the cultivated land and provide the leading export products. Forty thousand acres of coconut palms furnish food and raw material for the natives but are not important in foreign trade. Miscellaneous and root crops are grown on 20 percent of the cultivated land; and coffee, sisal, citrus, cacao, cassava, tobacco, corn, and rice account for only slightly more than 5 percent

TABLE 2.-*Percentage of cultivated land in major crops, 1933-34*

CROP	PERCENTAGE	CROP	PERCENTAGE
Bananas	35.6	Citrus	0.6
Sugarcane	19.6	Cacao	0.5
Coconuts	19.6	Cassava	(1)
Miscellaneous crops	11.3	Tobacco	(1)
Root crops	8.7	Corn	(1)
Coffee	3.1	Rice	(1)
Sisal	1.0	Total	100.0

[1] Less than 0.05 percent.

(table 2). These figures from the Collector General's report understate the acreage in crops grown on small farms; for instance, the estimated coffee acreage is 20,000, not 6,000 as shown by the report of larger farms.

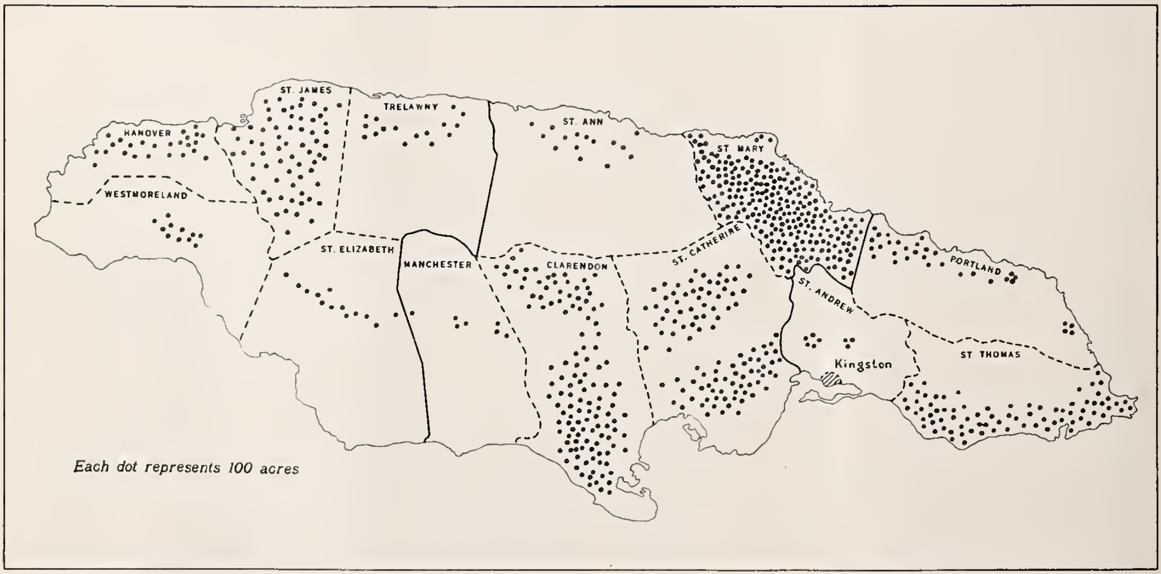
Bananas

Bananas have been Jamaica's most valuable export crop for years, although the wartime limitations on banana imports into Great Britain are pushing them out of first place. The banana was first taken to Jamaica in 1821, but was not cultivated extensively until late in the century. Captain Busch shipped a few bananas to the United States in 1868. He was so successful in selling them that a small company was formed the next year to ship the fruit. Several companies and individuals became interested in the growing industry, but in 1899 many of these merged into the United Fruit Company. This company controls most of the banana trade of the Caribbean.

The United States was the only market until 1901, when the Imperial Direct Line began shipping to Great Britain. A few years later hurricane damage forced the line to ask the United Fruit Company for aid, and both the line and the selling organization in England came under control of United Fruit but continued to have a strong competitor in the Standard Fruit Company. After several attempts to form a cooperative the Jamaica Banana Producers' Association started operations in 1929. Its influence grew rapidly, and most of the small growers now contract with the association. It had 42 percent of the 155,523 contracted acres in 1935.

Location and size of farms

The total area in bananas is estimated at 200,000 acres, although the known area in 1933-34 was only 72,909. Most of the acreage is on the coast and in the interior



Each dot represents 100 acres

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FIGURE 3.—Banana acreage in Jamaica, 1933-34.

valleys where the climate is warm and the rainfall is plentiful. The parish of St. Mary on the north side of the island had the largest banana acreage in 1933-34 - almost twice that of Clarendon, the next most important producing parish (fig. 3).

Many small settlers produce bananas on less than 1 acre. About three-fourths of the farmers who contract to sell their fruit to the exporting companies have total landholdings of less than 5 acres, and less than 2 percent have more than 50 acres. The large fruit companies own or lease 10 to 15 percent of the land held for bananas, but only a third of this acreage is actually planted. Since the establishment of the Jamaica Banana Producers' Association, the fruit companies have contracted more acreage from small producers.

Bananas on most of the land of the fruit companies are grown under irrigation. Small farmers usually cannot afford to fertilize, irrigate, and spray their plants adequately. Costs of production vary from one plantation to another, but estimates of the average cost in 1940 run as high as 55.5 cents per count bunch.

Costs of Production

	Dollars
Wage of laborers on banana plantation (daily)	0.504 to 0.807
Cutting cost (each 100 stems)	0.252
Average haul from field to railway (100 stems)	0.024
Average cost of planting and bringing an acre of virgin soil into production - not irrigated	80.70
irrigated	121.05
Cost per acre of keeping property in good condition (each year, including spraying)	60.53 to 96.84
Average price per acre of undeveloped banana land	100.88
Taxes (per $40 valuation)	0.656

Diseases

The Panama disease, the sigatoka leaf spot, and hurricanes make banana cultivation an uncertain business. More than half the plants are blown down by high winds every 2 or 3 years, and sigatoka spreads rapidly throughout the banana plantations, especially during the rainy season. The fruit companies, the Jamaica Producers' Association, and the government are all working to reduce the hazards of production. They are experimenting to produce a plant resistant to Panama disease and leaf spot, are spraying the trees with bordeaux mixture to control leaf spot, and the Government is helping the growers whose crop is destroyed by hurricanes.

Much progress has been made throughout the Caribbean banana zone in checking the spread of Panama disease, although it increased in Jamaica during 1940. Spraying is the only effective check for leaf spot thus far discovered. A Banana Leaf Spot Control Board was appointed in July 1939 to administer an 800,000-dollar loan to the industry. It has provided copper sulphate and lime for bordeaux mixture, which is distributed through the Jamaica Government Railway and agents of the fruit companies. The estimated cost of spraying with bordeaux mixture is $32.28 an acre. Plants are sprayed about once every 3 weeks in the wet season. Because of the unsatisfactory market conditions during the past year, many small farmers have abandoned spraying. Production will no doubt decline. Only about 75,000 acres can be sprayed satisfactorily. Unless a variety can be developed that is resistant to this disease, expansion in banana cultivation will be limited to those areas where spraying is feasible.

Cooperative organization

The Jamaica Banana Producers' Association is the most important subsidiary of the Jamaica Producers' Association. It concentrates on developing the British and Canadian markets through advertising and improved shipping facilities. Cooperative marketing by banana producers had been experimented with before the World War but the Jamaica Banana Producers' Association was the first organization to have any stability.

The association is a nonstock organization, designed to serve the small farmers as well as the large. It operates under a contract with the growers and agrees to purchase the entire crop at a specified minimum price. If the association sells the fruit for more than the minimum price, it pays the grower a dividend. Before the organization of the association, most of the private growers had to sell their fruit in the open market. The companies could then buy at a relatively low price as much fruit as they needed above that grown on their own land.

The association maintains a direct shipping line to the British market and an independent marketing organization. As a result of recommendations of the Jamaica Banana Commission in 1936, the three exporting companies, the United Fruit Company, the Standard Fruit Company, and the association itself, agreed to a price policy and a rationalization of the industry. The association ceded the United States and Canadian markets in exchange for guaranteed full shiploads to England.

Government policies

The most important government action affecting the industry is the wartime prohibition of banana imports into the British Empire, first ordered in October 1940. To relieve the banana producers the Imperial Government later agreed to purchase a certain quantity of exportable bananas, whether or not they could be shipped. They arranged on November 1, 1940, to pay 70.6 cents per count bunch[1] for a maximum of 12 million stems during the subsequent 12 months. The price was reduced to 60.5 cents a few days later and the quantity soon increased to 14½ million stems. The Government will buy up to 12½ million stems at 70.6 cents a count bunch between November 1, 1941, and October 31, 1942. Five cents will be deducted, however, to aid in controlling leaf spot. The Government has recovered part of its losses on the 1940-41 purchases by exporting fruit to Canada and the United States. Part of the fruit was distributed free to the natives to supplement their diet.

Trade

Banana export data show an upward trend, the years of unusually low exports coinciding with hurricanes or other adverse weather conditions (fig. 4). The peak of banana exports came in 1937 when almost 27 million stems were exported. The sharp drop in 1940 is explained by the restriction of imports into the British market because of the war. Preliminary data for 1941 indicate exports of 5½ million stems. Both bananas and plantains are used extensively in the local diet, although data on domestic consumption are not available. The working classes are eating more bananas since the British limitation on imports.

[1] A count bunch contains 9 hands, or sections; 8-hand bunches are figured at three-fourths count, 7-hand bunches at one-half count.

Since 1932 the United Kingdom has been the principal market for Jamaican bananas. Before that the United States took almost half the exports. In 1932, however, the United Kingdom granted Empire preference to bananas. Empire bananas now enter the British market free, while bananas produced outside the Empire must pay a duty of 0.45 cent a pound (Import Duties Act of 1932 and Ottawa Agreement of October 1932). Empire bananas are duty-free in the Canadian market under the Canada-Jamaica Trade Agreement of 1925, while foreign bananas are subject to a duty of 50 cents a stem. The 1940 crop went largely to Great Britain as usual, but in October British import restrictions shifted the destination to the United States and Canada. Most of the 1941 exports went to these two markets (table 3).

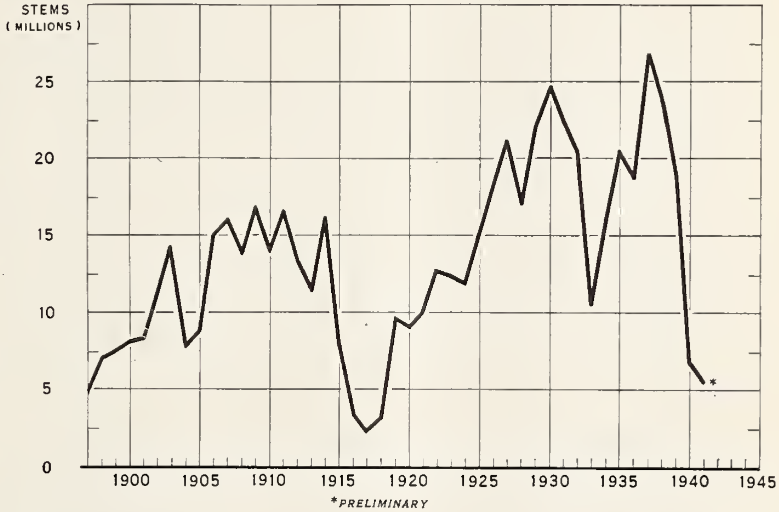

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FIGURE 4.—Banana exports from Jamaica, 1897-1941.

TABLE 3.—*Percentage distribution of Jamaican banana exports, by country of destination, 1929-38*

YEAR	UNITED KINGDOM	CANADA	GERMANY	UNITED STATES	OTHERS
1929	18.3	11.6	17.0	48.6	4.5
1930	30.1	12.9	7.3	49.7	0.0
1931	37.9	14.9	0.5	44.6	2.1
1932	65.1	13.0	-	21.5	0.4
1933	79.4	17.4	-	3.2	-
1934	78.5	16.7	-	4.4	0.4
1935	79.1	11.5	-	5.3	4.1
1936	82.3	13.1	1.0	0.2	3.4
1937	74.5	9.7	1.5	0.2	14.1
1938	83.5	9.7	2.5	-	4.3

Before the war Jamaica usually furnished about 80 percent of total British imports. When severe hurricanes destroyed Jamaican fruit, the Central American countries and Colombia sent bananas to England.

Sugar

Sugar, the basis of the Jamaican economy in the seventeenth and eighteenth centuries, because of the war is again becoming the most important export.

The Spaniards planted sugarcane in Jamaica in the sixteenth century, and the English developed the young industry with the aid of slave labor. Production expanded steadily to a peak of 134,400 short tons in 1805. Sugarcane occupied almost 60 percent of all land in use, and about 70 percent of the population was engaged in its cultivation. Jamaican sugar was important not only in the domestic economy but in the market of the mother country as well. Britain bought from a third to two-thirds of its requirements from this island and also many gallons of rum made from sugar.

The industry declined after 1805, and in 1840 only 39,120 tons of sugar were exported. Production remained depressed until World War days, but sugar growing was still important, ranking second to the growing banana industry. The World War increased prices and encouraged the establishment of several modern factories. Production more than doubled during the war, and in 1920 the value of the sugar crop was higher than at any time since the Napoleonic Wars. Production and exports of both sugar and rum expanded steadily, and sugar exports have averaged more than 100,000 short tons recently.

After the war began in 1939, Great Britain purchased more and more sugar from the colony. War again favored expanded sugar production, and the 1941 estimated crop is more than 175,000 short tons. Exports increased during 1941 and pushed ahead of bananas in value for the first time in 50 years.

The present production of 100,000 to 150,000 tons of sugar is insignificant in the world supply of more than 16 million tons, but it represents 15 percent of Canadian imports, about 1 percent of Great Britain's imports, and local sugar needs for more than a million people. The sugar industry is important locally because it employs many persons on the plantations and in the factories.

Size and location of the industry

Sugarcane grows in the interior valleys and northeast coast regions. Seven thousand farmers were registered cane growers in December 1940, and the estimated acreage was 52,696, an increase of 18 percent over that of the previous year.

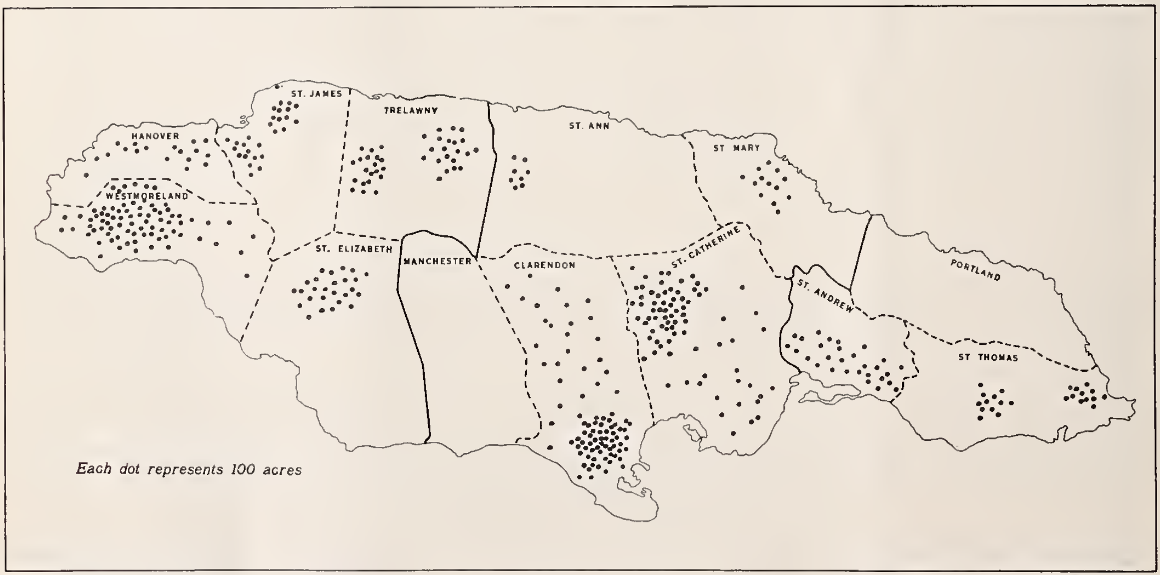

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FIGURE 5.—Sugarcane acreage in Jamaica, 1933-34.

Distribution among parishes may have changed lately, but the principal producing parishes in 1933-34 were Clarendon, St. Catherine, and Westmoreland, each having about 20 percent of the total sugar acreage (fig. 5).

Thirty-four sugar factories, seven of them owned by the West Indies Sugar Company, grind sugar on the island. The plantations owned by these large factories furnish 75 percent of the cane ground, and the rest comes from small farmers located near the factories. The 34 factories produced 121,237 short tons of sugar and 1,596,215 gallons of rum in 1937.

TABLE 4.–*Factory production of sugar and rum, by parishes, 1937*

PARISHES	NUMBER OF FACTORIES	PERCENTAGE OF TOTAL SUGAR PRODUCED	PERCENTAGE OF TOTAL RUM PRODUCED
St. Thomas	2	14.6	16.4
St. Mary	1	4.9	3.6
St. Ann	2	2.5	3.6
Trelawny	5	7.2	8.0
St. James	4	6.9	8.1
Hanover	2	4.3	4.4
Westmoreland	7	19.1	16.4
St. Elizabeth	3	3.1	16.8
Clarendon	3	16.9	18.3
St. Catherine	5	20.5	14.4
Total	34	100.0	100.0

Cultivation

The large plantations employ improved methods of cultivation and cutting and use the more productive varieties of cane. Small farmers with limited resources cannot keep up with all the new methods. More and more farmers are using fertilizers on their fields and attempting to use machinery in cultivation. Deep drains in the fields, however, discourage the use of machinery.

The predominant variety of cane is B. H. 10/12, although the P. O. J. 2878, which is highly resistant to the mosaic disease, is increasing rapidly in popularity. Almost three-quarters of the acreage is in these canes. Much of the increased sugar production is due to the improved canes with their higher sugar content.

The average yield in 1937 was 32.57 short tons of cane an acre compared with 19 in Cuba. The yield of cane has been increasing as well as the efficiency of juice extraction. The tons of cane required to produce 1 ton of sugar declined from 10.27 for the 1936-37 crop to 9.92 in 1937-38. This compares with 8.2 in Cuba for 1937. The yield of sugar per acre in 1937-38 was 3.3 tons compared with 2.2 tons in Cuba. The grinding season begins in December and lasts until July or August.

Mosaic disease, prevalent a few years ago, is being controlled, largely by planting disease-resistant varieties. The moth borer and sugarcane aphis damage a small percentage of the cane.

Associations and Government policies

The Sugar Manufacturers' Association, founded in 1929, includes all 34 sugar-estate owners and may do anything to aid the industry. It handles all local sugar sales and supervises the rum sales pool. Sugar planters - big and little - have formed a new All Island Cane Farmers' Association to encourage growing of cane by farmers and orderly delivery to factories.

Both the Imperial Government of Great Britain and the local government of Jamaica have influenced the sugar industry. Great Britain has aided it by giving preferential rates to Empire sugar since 1919. But through its subsidy to domestic sugar beet growers, established in 1925, Great Britain reduced the effectiveness of this aid. The present preference is 95.829 cents per 100 pounds. Jamaican sugar has received a preference of $1 per 100 pounds in the Canadian market since 1902.

The local government controls the manufacture of sugar and rum and prohibits the importation of sugar. The Sugar Industry Control Law of December 14, 1933, placed control of sale, manufacturing, price, and importation under a Sugar Control Board and levied an excise duty of 1.26 cents a pound, at current official rate of exchange, on all refined sugar manufactured in the colony. The legislation was changed in 1936 and again in 1937 and a new board was appointed. It has responsibilities comparable with those of the old board and new duties with reference to quotas and registering and licensing of cane farmers, made necessary by the International Sugar Agreement.

The legislature ruled in 1929 that a certain percentage of sugar production must be retained for local consumption. Each plantation sells a certain percentage of its output on the local market. This proportion has varied between 20 and 25 percent during the intervening years. An export subsidy of 0.35 cent per pound was authorized, but it has not been paid each year. A sugar manufacturing board regulates domestic sale, and all sugar for local use is distributed through the Sugar Manufacturers' Association.

The International Sugar Agreement of 1937 regulates production and marketing of sugar throughout the world. The colonial quota for Great Britain is established each year, and in turn the export quota for Jamaica is determined. After the war started it was evident that more sugar could be sold than the agreement called for, and it has been virtually inoperative during the past 2 years.

The British Government purchased the export sugar crop for 1939-40 at a price of 2.002 cents a pound, c.i.f. the United Kingdom, and the 1940-41 crop at 2.23 cents a pound. It promised to purchase the 1941-42 export crop at the same price. With this assurance of a market both estate growers and small cane farmers planted more cane.

Trade

Production is primarily for the export market, although the quantity shipped has been strictly regulated. Recently the sugar retained for local consumption has averaged 18,000 short tons, or 30 pounds a year for each inhabitant, compared with about 90 pounds per capita in the United States. About 22,000 tons of sugar are reserved for local use in 1941-42. Exports reached almost 118,000 short tons in 1938 and 153,692 short tons in 1941 (fig. 6). Rum exports have declined relative to sugar exports.

Practically all the sugar and most of the rum exported are sold now to other British Empire countries, largely the United Kingdom and Canada. For a time during the latter part of the nineteenth century the United States was the principal sugar market. When Canadian preference was established in 1902, the market shifted, and Canada took three-quarters of the sugar before the present war. England took from half to 85 percent of the rum. Since the war began, England has been taking more and more of the sugar exports, in 1940 over half, and preliminary estimates for 1941 show 66 percent going to the United Kingdom.

Canada, which has been the natural market for West Indies sugar, is encouraging expansion in the domestic beet sugar industry. When the demand for sugar in England falls off again after the war, it may be difficult to find a market for Jamaican sugar.

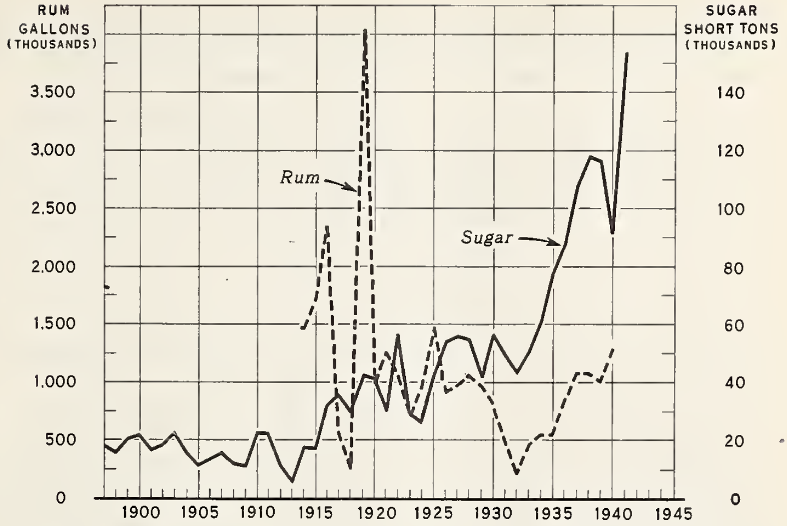

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FIGURE 6.—Sugar and rum exports from Jamaica, 1897-1941.

TABLE 5.—*Percentage distribution of sugar and rum exports from Jamaica, by country of destination, 1910-41*

PRODUCT AND DESTINATION	AVERAGE 1910-14	AVERAGE 1933-37	1938	1939	1940	1941
Sugar:						
United Kingdom	20.8	26.2	12.9	39.2	52.9	65.5
Other British Empire countries (largely Canada)	75.4	73.8	87.1	60.7	46.2	34.5
United States	1.6	-	-	-	-	-
Other countries	2.2	-	-	0.1	0.9	-
Rum:						
United Kingdom	83.9	65.7	68.3	58.7	(2)	(2)
Other British Empire countries	4.5	10.0	8.2	2.2	(2)	(2)
United States	0.7	7.5	5.0	8.5	(2)	(2)
Other countries	10.9	16.8	[1] 18.5	30.6	(2)	(2)

[1] 16.1 to Germany.

[2] Destination not available at present.

Coconuts

The coconut industry is extensive and furnishes one of the major food staples of the island. The coconut acreage is as large as that of sugarcane (40,000 acres), centered largely in the eastern and northeastern section. The three parishes of St. Thomas, Portland, and St. Mary had 70 percent of the acreage in 1933-34. The industry has grown rapidly since 1900, when only 10,000 acres were in coconuts.

The Jamaica Coconut Producers' Association, established in 1930, has greatly stimulated the industry, and restriction of copra and other edible-oil imports has encouraged local conversion of nuts into copra and oil. The island is now practically self-sufficient in edible oils and produces much of its own soap and glycerin from coconut oil. The Coconut Products Board, set up in 1931, advises on prices and the exportation and importation of oil and copra.

Coconut acreage, 1933-34

	Acres
St. Andrew	40
St. Thomas	7,020
Portland	10,500
St. Mary	11,050
St. Ann	4,440
Trelawny	2,590
St. James	590
Hanover	3,190
Westmoreland	4
St. Elizabeth	20
Manchester	10
Clarendon	120
St. Catherine	490

Control of the industry is further centralized under defense regulations. All companies manufacturing products from coconuts have been grouped together and production stiumlated by limiting imports of soap, margarine, and cooking fats. Production from coconuts in 1940 included:

	Pounds
Margarine	1,398,477
Butterine	277,206
Compound lard	1,092,694
Special soap	41,584
Common laundry soap	5,039,150
	Gallons
Edible oil	560,175

Coconut consumption as food is large in the interior, and local factories use 30 to 35 million nuts a year to produce copra. In addition, Jamaica holds first place in supplying fresh coconuts for the export trade. Total Caribbean shipments in 1937 were 80 million nuts, of which Jamaica furnished 34 million. Exports have been fairly uniform over the past 10 years. The United States is the best market for the nuts, taking about 60 percent of the total. Canada and the United Kingdom take the rest, with the proportion going to Canada increasing recently.

During the early 1930's about 3,000 tons of copra were exported annually, but exports are now very small. With the stoppage of copra and coconut shipments from the Philippines, Jamaica and other tropical countries in the Western Hemisphere have an opportunity to expand production of copra and oil for the United States market.

Citrus Fruit

Citrus production and exports are expanding, and before the war the outlook was bright for developing a prosperous industry. Fresh oranges and grapefruit are the leading exports, although orange- and lime-oil exports have averaged about $86,000 a year in value.

A few years ago citrus was produced only on small farms as a side line. About 5,000 acres have been planted to oranges and grapefruit during the past 10 years, however, and wealthy estate owners planted an additional 1,500 acres of Marsh Seedless grapefruit and Valencias and early oranges in 1939-40. The known citrus area in 1933-34 was only 1,245 acres, although many small holdings were probably not included in this total. Three-quarters of the total acreage was concentrated in St.

Catherine, Manchester, Clarendon, and Portland. Production from the new plantings will probably be on the market during the next 5 years. Estimates of total production from these trees run as high as 1 million boxes.

Jamaican citrus has fine flavor and could be developed into first-quality fruit. Cultivation methods, however, are not comparable with those in the United States, particularly on the smaller acreages. On the large estates, however, the land is fertilized and irrigated and the trees are sprayed.

Aids to the industry

The local government has helped producers finance expansion of the citrus industry and market their product. It helped establish a central packing house in 1930, prohibited the importation of citrus in 1934, and established a Citrus Development Loan Board in 1935 to grant loans for expanding production. The Marketing Division, a branch of the Department of Agriculture, markets fruit for a number of producers.

Peasant proprietors are aided by the Jamaica Citrus Producers' Association, established in 1929. Members of the association market their fruit through it, and control about 50 percent of the grapefruit and 60 percent of the oranges produced.

The Imperial Government allows Jamaican citrus free entry into Great Britain and imposes a tariff of 90 cents a 100 pounds on grapefruit and 10 percent ad valorem on oranges from non-Empire sources.

Trade

Citrus fruit has increased to fifth place in value of exports, averaging $800,000 from 1937-39. Oranges and grapefruit accounted for four-fifths of this total (table 6). Grapefruit led the list a few years ago, with more than four times the value of oranges. Lately, however, orange exports have jumped to first place and have now twice the value of grapefruit exports. Orange exports reached a peak of 347,000 boxes (200 to a box) in 1936, but have since declined. Grapefruit exports were relatively stable during the 1930's. Estimates of fruit rejected for export run as high as 25 percent of total exports. About 100,000 cases of oranges and grapefruit go into domestic consumption, and another 100,000 cases of oranges go into the production of orange oil. This would indicate a production of about one-third more than exports.

British Empire countries have been almost the only markets for Jamaican citrus. The United Kingdom takes from three-quarters to nine-tenths of the grapefruit. Until the middle 1930's Canada was the only other market. Since then New Zealand and Bermuda have become important markets, and Canada has taken much less, both relatively and absolutely. Canada was the principal market for oranges until 1936, when the United Kingdom took almost all the great increase in total exports. The United Kingdom has continued to take large supplies of oranges, increasing its share of the total to almost three-quarters. New Zealand and Bermuda have at times been important markets, New Zealand sometimes taking as much as 30 percent of the total.

Jamaica supplies only a small percentage of the citrus requirements of Canada and the United Kingdom. Spain, Palestine, and Italy have been the principal sources for British consumption, and the United States has supplied most of Canada's requirements. Under the United States-Canadian trade agreement, United States citrus can enter the

Canadian market free from January to July (period under original agreement was December to April). The shipments from the United States have increased during the past few years and those from Jamaica have declined.

TABLE 6.-*Average value*[1] *of Jamaican exports of citrus fruit and citrus products, 1929-31 and 1937-39*

PRODUCT	AVERAGE VALUE OF EXPORTS 1929-31	AVERAGE VALUE OF EXPORTS 1937-39	PRODUCT	AVERAGE VALUE OF EXPORTS 1929-31	AVERAGE VALUE OF EXPORTS 1937-39
	Dollars	*Dollars*		*Dollars*	*Dollars*
Oranges	56,246	456,552	Orange oil	-	54,931
Grapefruit	262,064	211,903	Lime oil	-	32,947
Limes	-	29,180	Lime juice	-	6,630
Lemons	-	10	Orange juice	-	5,299
Ugli fruit	-	3,491	Grapefruit juice	-	4,856
Tangerines		3,044	Total	-	808,843

[1] Converted at the average rate of exchange for 1929-31 of 475.1332 cents to the pound sterling and for 1937-39 of 475.63 cents.

The only citrus products shipped to the United States are lime and orange oil; 60 percent of the lime oil and almost 30 percent of the orange oil were sold to the United States in 1937-39. The other important markets before the war were the United Kingdom for lime oil and Germany for orange oil.

The Ministry of Food in England purchased the entire 1940-41 orange crop, although exports continued to Canada and Bermuda. Very few grapefruit were accepted by the Food Ministry, and during the first 8 months of 1941 no grapefruit were shipped to England. The Jamaica Marketing Department was the only exporter of citrus in 1940-41. Great Britain has contracted to purchase from the 1941-42 crop 5,000 long tons each of sweet and bitter orange pulp, and 7,500 tons of grapefruit pulp. It will require 125,000 boxes each of bitter and sweet oranges and 187,000 boxes of grapefruit to produce the pulp, or approximately the whole export crop. The manufacture of bitter and sweet orange oil for export is prohibited by local regulation to insure enough pulp for Great Britain.

The 1941-42 marketing season began in August and will continue through March or April. Exports of fresh fruit during the first 8 months of the 1941 calendar year show a drastic reduction for both grapefruit and oranges, but data on British purchases of fruit for conversion to pulp from September through December are not yet available.

Prices

The average export value of both grapefruit and oranges declined during the past decade. The prices set by the British Food Ministry for the 1941-42 pulp purchases average $3.23 a box for bitter oranges and $2.91 for sweet oranges and grapefruit, or a per-box price twice as high as the export price of 1939.

The minimum price to the grower is 71 cents a box. About 30 percent of the fruit is grown under contract, however, and the return to these growers is in proportion to the net return after all manufacturing costs have been paid. These growers may therefore receive a higher return per box than the minimum price.

TABLE 7.–*Average export value of oranges and grapefruit, 1929-39*

YEAR	GRAPEFRUIT PER BOX OF 100	ORANGES PER BOX OF 200	YEAR	GRAPEFRUIT PER BOX OF 100	ORANGES PER BOX OF 200
	Dollars	*Dollars*		*Dollars*	*Dollars*
1929	2.95	2.31	1934	2.36	2.09
1930	2.91	2.30	1935	2.16	1.93
1931	2.24	2.27	1936	1.92	1.72
1932	1.80	1.71	1937	1.63	1.59
1933	2.17	1.96	1938	1.36	1.45
			1939	1.36	1.59

The cost of the fruit to the Marketing Department is $1.97 a box and includes in addition to the grower's price the cost of transportation, rejects, packing materials, and wharfage in Kingston.

Coffee and Cacao

Coffee and cacao are the principal money crops of small farmers. During the latter half of the nineteenth century when sugar growing became unprofitable for small growers, farmers turned to coffee and cacao. The known acreage is small, a little more than 6,000 acres for coffee and 900 for cacao, but estimates of total acreage run as high as 20,000 for coffee and 2,500 for cacao. Both crops grow on the slopes of the mountains below the frost line.

There are several grades of coffee, but Blue Mountain is the most valuable. It usually sells for twice as much as the other grades. It represents, however, only a small percentage of the total exports.

	Percentage of exports
Blue Mountain	2.5
Blue Mountain Valley	3.5
Manchester A	20.0
Manchester B	20.0
Good Ordinary	30.0
Ordinary	24.0

Dealers in Kingston purchase coffee from the estates and small farmers. They advance money for harvesting with the understanding that they may purchase the crop when available. All the coffee is purchased during the harvesting season and either stored in warehouses to await orders from abroad or consigned to selling agents in foreign countries.

The main cacao crop matures from September to February and averages about 5 million pounds. The spring crop matures from April to June and averages 3 million pounds.

Both cacao and coffee are produced for the export market, although the 7 to 10 million pounds of coffee exports and the 2 to 7 million pounds of cacao are not important in world supplies. Domestic consumption of coffee is 1 million pounds, or from 10 to 20 percent of production. Exports of coffee increased slightly during the past 10 years, while cacao exports declined. The unusually depressed exports of 1940 reflect the drought conditions of that year.

Canada is the most important market for both crops. Before 1932 the United States took about half the cacao. The present outlook is unusually good, Canada taking all that is offered. The price in Kingston was about $9.19 per 100 pounds in November 1941, or more than twice the average value of the 1940 crop.

Allspice and Ginger

Spice has always been an important item in the trade of Jamaica. Allspice and ginger are the principal types produced.

Allspice is the unripe fruit of the pimento tree *(Pimenta officinalis).* The fruit is gathered and dried in the sun to produce the aromatic spice. Jamaica is the sole commercial producer. Allspice exports have been important for many years, accounting for from 3 to 5 percent of the total value of exports. Small farmers of Manchester and St. Ann Parishes depend on it for a large share of their income. Since 1934 the pimento trees have been infected with rust, which some years cuts production in half.

Jamaica ginger is the spicy rootstock of *Zingiber officinale.* The main crop matures in January and the ratoon crop in November. Even though ginger is commonly associated with Jamaica, China has long been the principal source of world supplies.

Exports of allspice varied between 6 and 12 million pounds until 1940 when they dropped to 3.5 million pounds. Ginger exports range from 2 to 3 million pounds. Half the ginger goes to Great Britain, with the United States taking about one-third and Canada the remainder. Before the war Germany and France were the principal markets for allspice, although in some years the United States took almost half the exports. The United States, Great Britain, and Canada took most of the exports in 1940 and 1941.

Tobacco

Cigar tobacco is one of the important minor crops of the island, although production there is not significant in world supplies. The average crop is about 500,000 pounds grown on from 1,000 to 1,200 acres. St. Andrew, Clarendon, and St. James are the important producing parishes. The best quality tobacco is grown in Clarendon along the Minho River where the soils are enriched by annual floods.

Tobacco is primarily a small-farm crop. Most of the production is Havana-type leaf used entirely as filler. Seeds must be imported every other year to retain the quality of the product. The farmers use very little fertilizer and no shade. They produce one crop each year, which they harvest in January, February, and March. They dry the leaf and deliver it to the buyers' warehouses, where it is cured and classified. The buyers finance the small growers, and one large company buys half the crop for manufacture.

Before 1936 much of the product was of inferior quality for local pipe use in the form of "donkey-rope." A new tobacco station was erected in 1936, and a tobacco specialist appointed to assist the industry. There has been much improvement in curing and marketing, because of the work of the specialist and the Jamaica Agricultural Society in distributing information on cultivation, curing, and control of pests and diseases.

Imports and domestic production of leaf have been about equal for several years. Total supplies of leaf have averaged about 1 million pounds recently. About 30,000 pounds of the 500,000 pounds imported were cigar wrappers. Most of the other imported tobacco was for cigarettes.

Data on local use of cigars and cigarettes domestically produced were not available before 1939. Since then, however, from 5 to 10 percent of the imported and domestic leaf has gone into the manufacture of cigars and the remainder into cigarettes. In addition, 6 percent of domestic cigarette requirements - from 44,000 to 50,000 pounds - was imported. About half the cigars manufactured in Jamaica are exported. The trend of leaf imports has been upward over the past 10 years while cigarette imports and cigar exports have declined.

TABLE 8.—*Tobacco production, imports, exports, and consumption, average 1939-40*

PRODUCT	PRODUCTION	IMPORTS	EXPORTS	CONSUMPTION
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Unmanufactured tobacco	[1] 500.0	542.8	119.9	[2] 922.9
Manufactured tobacco:[3]				
Cigarettes	934.6	60.9	-	995.5
Cigars	107.6	.015	46.6	61.0
Others	.5	7.6	-	8.1
Total manufactured	1,042.7	68.515	46.6	1,064.6

[1] Approximate.

[2] Leaf imports fell off sharply in 1940 because of the war. Accumulated stocks probably had to be drawn on for the domestic production of cigars and cigarettes.

[3] Approximate leaf equivalent.

Before the war the United States supplied a little more than half the leaf imports, Southern Rhodesia about one-third, and Canada the remainder. The United States and Canada now have the market. Leaf exports go largely to the United Kingdom. The United Kingdom supplied nine-tenths of the cigarette imports and the United States one-tenth before the war, but now the United States is supplying about one-quarter, and almost all the other manufactured tobacco. Panama is the best market for Jamaican cigars, with the United Kingdom next in importance.

Miscellaneous Food Crops

Most small farmers raise a few acres of corn, yams, breadfruit, and plantains for home use. Information on acreage of these crops is scarce. The known area in 1934 was 17,774 acres in root crops and 23,122 acres in miscellaneous crops ("mixed cultivation"), which may include food crops.

The government is encouraging local cultivation of food crops through financial assistance and loans for agricultural development. The 1940 area in corn, peas, and beans was 23,973 acres, which may be sufficient to eliminate imports. All food imports are regulated through licenses. The most important food imports have been grain products - wheat, corn meal, and rice. A new mill began operation at Kingston in 1940 to grind domestic corn, and experiments have been made the past few years to expand rice production. Even with encouragement of local production, imports of rice in 1940 were 49 million pounds, of wheaten (wheat and rye flour) 91 million pounds, and of corn meal 3.5 million pounds (a reduction from 16 million in 1939).

TABLE 9.—*Major food imports into Jamaica, average 1939-40*

PRODUCT	QUANTITY	VALUE	PRODUCT	QUANTITY	VALUE
	1,000 pounds	*1,000 dollars*		*1,000 pounds*	*1,000 dollars*
Wheaten (wheat and rye flour)	93,408	1,873	Condensed milk	7,529	547
Rice	43,191	896	Fish	25,998	741
Corn meal	9,748	188	Butter	628	152
Meat	3,270	379	Butter substitutes	227	20
			Salt	18,524	100

A small export trade in minor fruits and vegetables was started in 1937. The Low Temperature Research and Marketing Station packs, ships, and sells the products for the growers. So far this is a small enterprise, but it handles a variety of products, including mangoes, tomatoes, eggplant, sweet peppers, and string beans.

Livestock

Large areas of good pasture land are suited to livestock production, but the industry has been stationary for many years. Meat and dairy products are imported to supplement home production. Cattle and goat hides are the only livestock products that are produced in sufficient quantity for export. Considerable improvement in marketing and distribution facilities is needed before the industry can expand materially.

The estimated cattle population on December 31, 1939, was 124,257. It has not changed much in the past 20 years. In 1939 there were also 10,977 horses, 10,800 asses, and 10,200 sheep. The number of goats is not available, but slaughter data indicate that they are plentiful.

	Annual average slaughter
Cattle	23,500
Calves	500
Pigs	25,000
Goats	164,000
Kids	36,000
Sheep	2,700
Lambs	9,000

The parishes of St. Ann and Westmoreland are the large cattle producers. They had 36 percent of the total in 1937-38. Most of the parishes have more than 1,000 horses, and St. Catherine, Clarendon, and Westmoreland have more than 3,000 each.

More than half the cattle are creole stock, descendants of the cattle that covered the lowlands in colonial days. The rest are Angus, Holstein, and Zebu. The Hope Stock Farm is improving the breeds and encouraging penkeepers (as cattle producers are called in Jamaica) to improve their herds. Laws enacted in 1888 provide that fences must be erected and cattle kept within them. More recently the local legislature has regulated importation of cattle, passed disease-control bills, and provided for control of ticks.

Estimated meat consumption varies between 23 and 27 million pounds a year, 13 or 14 percent of which is imported. About two-thirds of the meat imported is beef. The United Kingdom is usually the largest supplier, furnishing one-third of the total, with the United States, Argentina, and Canada sharing the other two-thirds.

While some cattle and goat hides are exported, they account for only a small percentage of total exports. England and Canada are the principal markets, although Germany was important before the war. The domestic tanning industry uses most of the hides and produces about 400,000 pounds of leather a year, using native mangrove bark and divi-divi for tanning. About 20,000 pounds of leather are exported, largely to other islands of the West Indies.

Imports of condensed milk are more valuable than total meat imports. From 8 to 10 million pounds of condensed milk, valued at 600,000 to 800,000 dollars, were imported before the war. Imports dropped in 1940 to 4.9 million pounds. The Netherlands supplied about half the condensed milk before the war and Canada and the United States the rest. The new condensery in Kingston, established in 1938, may soon produce enough processed milk to take care of domestic needs. Data on local milk production are not available. From 100,000 to 200,000 dollars' worth of butter is imported annually and 30,000 dollars' worth of butter substitutes.

Forest Products

Much valuable second-growth timber - cedar, mahogany, rosewood, logwood, fustic, and bamboo - is available, but virgin forests are not extensive. Dyewoods and dyewood extracts are the most valuable forest-product exports, but about 400,000 dollars' worth of hardwoods is used locally. Timber exports average only $8,000 to $12,000 in value a year. Logwood exports vary from 6,000 to 28,000 tons, with a value of from $56,000 to $355,000. Exports of logwood extracts average 2 million pounds, valued at $300,000. Another 20,000 to 30,000 dollars' worth of annatto is exported annually. Annatto is a yellowish-red dye from the fruit of the annatto tree. It is used to color butter, cheese, and varnish.

Foreign Trade

Foreign trade is controlled strictly. Exports of many items are prohibited, and others may be exported only under license. Most imports are subject to a high tariff and a package tax, some are regulated by licenses, and others are subject to definite quotas.

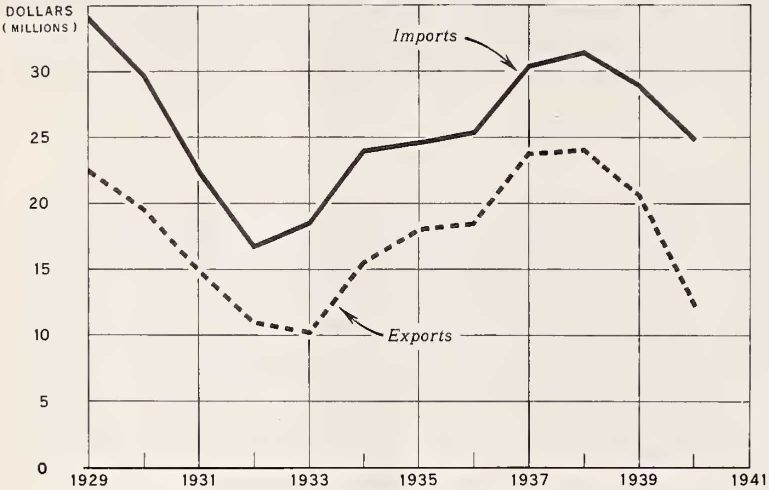
Imperial Preference

Until the present war the most important influence on Jamaican trade was the policy of Imperial preference, applying both to exports from and imports into the island. Great Britain inaugurated the policy in 1919, when Empire tobacco was granted preference in the British market. From time to time preference was given to other products, notably sugar, and in 1932 the Ottawa Agreements extended it to a large number of items. The agreements allow free entry into Great Britain of many Empire products, the important ones from Jamaica being bananas, grapefruit, oranges, and honey.

Many imports from Empire countries, particularly Great Britain and Canada, enjoy preferential treatment in Jamaica. The margins of preference were increased in 1932 in line with recommendations made at the Ottawa Conference. Under the United Kingdom-United States Trade Agreement the margins of British preference were reduced on corn, cigarettes, other manufactured tobacco except cigars and snuff, and certain other manufactured products, including lumber. United States products enter Jamaica under the general tariff. Jamaica benefits from preference for its products in other Empire countries, particularly Canada.

Exports and Imports

Local control of both imports and exports was intensified when the war started in 1939. Imports from both non-Empire and Empire countries were restricted to conserve exchange and shipping space. Preferential rates, trade agreements, and other special trade measures will be practically ineffective for the duration of the war.



INCLUDES PARCEL POST ITEMS; EXCLUDES REEXPORTS AND GOLD

U. S. DEPARTMENT OF AGRICULTURE NEG. 27 OFFICE OF FOREIGN AGRICULTURAL RELATIONS

FIGURE 7.—Value of Jamaican imports and exports, 1929-40.

Ordinarily the value of imports into Jamaica exceeds that of exports, and both have followed business cycles very closely (fig. 7). The low point in exports, however, was reached in 1933 instead of 1932, reflecting the drop in banana exports because of a severe blowdown.

The British Empire countries, largely the United Kingdom and Canada, are most important in the trade. Since 1932 they have become increasingly important, although the United States supplied about one-fifth of the imports in 1939 (table 10). The United States took about a third of total exports before the Ottawa Conference, but has taken a smaller proportion since then.

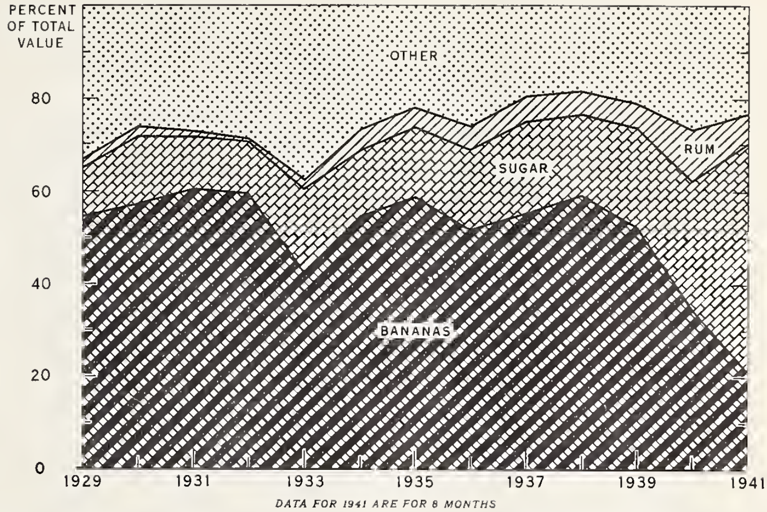
Bananas, sugar, and rum together account for almost three-quarters of the total of Jamaica's export trade. The wartime drop in banana exports is made up for by the increase in sugar (fig. 8). Other important exports in percentage of total value in 1940 were:

	Percent
Citrus	4.5
Allspice	3.9
Coffee	3.7
Logwood extract	2.6
Coconuts and copra	2.1
Ginger	1.5

Imports, including food items as well as industrial products, vary widely. Flour imports have averaged about 7 percent of the total import value, fish about 5, rice 3, milk 2.5, and meat 1.5. The 10 most important imports during the past 10 years have averaged about 50 percent of the total value (table 11).

The war will probably intensify Jamaica's effort to become self-sufficient in food production. Limited trans-Atlantic shipping space will tend to divert exports of fruit and sugar to the United States and Canada, but the resulting dollar exchange will probably be used for purchasing industrial products rather than foodstuffs.

While Empire preference has been the most important influence in Jamaican foreign trade in recent years, the war makes such measures ineffective. The trade built up between the United States and Jamaica during the war, however, may fall off sharply when the war is over.



DATA FOR 1941 ARE FOR 8 MONTHS

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FIGURE 8.—Principal exports from Jamaica, in percentage of total value, 1929-41.

TABLE 10.—*Exports and imports of Jamaica in percentage of total value, by country, 1929-40*[1]

EXPORTS

COUNTRY	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
United Kingdom	18.0	27.0	32.3	50.0	56.0	54.8	56.1	54.1	55.6	59.2	63.2	61.6
Canada	23.9	26.1	26.2	26.4	27.6	29.5	28.0	29.6	24.7	26.6	23.7	25.9
Other British Empire	0.8	0.8	0.8	0.8	1.0	1.3	1.2	1.7	1.2	1.1	1.9	2.5
United States	34.0	33.6	31.3	17.6	9.3	9.2	8.9	7.2	5.0	3.6	5.6	8.5
Others	23.3	12.5	9.4	5.2	6.1	5.2	5.8	7.4	13.5	9.5	5.6	1.5
Thousand Dollars	22,366	19,638	14,902	10,999	10,156	15,461	18,093	18,382	23,815	24,085	20,571	12,270

IMPORTS

COUNTRY	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
United Kingdom	25.2	28.4	28.4	39.7	38.8	37.7	39.0	37.0	32.7	31.9	29.1	31.3
Canada	17.3	15.7	16.8	14.5	15.5	15.4	15.9	15.9	14.5	15.8	17.7	25.0
Other British Empire	9.9	11.3	12.7	12.6	13.3	13.7	14.5	18.0	18.2	15.7	16.8	20.8
United States	29.7	31.7	28.9	17.2	15.8	17.8	17.6	16.4	17.7	21.2	23.2	15.9
Others	17.9	12.9	13.2	16.0	16.6	15.4	13.0	12.7	16.9	15.4	13.2	7.0
Thousand Dollars	34,110	29,654	22,416	16,657	18,494	24,012	24,553	25,212	30,331	31,405	28,861	24,831

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[1] Including parcel-post items but excluding gold and reexports.

TABLE 11.–*Principal imports*[1] *into Jamaica in percentage of total value, 1929-40*

ITEM	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Machinery	3.2	4.4	3.5	3.3	4.8	5.0	6.0	4.7	5.6	8.0	3.9	3.1
Flour	6.5	6.2	7.0	6.9	8.7	7.1	7.1	7.7	6.5	7.0	6.7	7.3
Oils and fuel	14.0	7.3	8.5	8.6	6.0	7.3	7.0	6.9	7.9	6.9	7.6	8.1
Cotton piece goods	6.6	7.1	5.7	6.8	5.8	7.2	8.6	7.6	6.8	6.0	6.2	5.6
Iron and steel	3.5	3.5	3.6	2.8	3.0	3.3	3.2	3.0	4.3	5.4	3.0	3.5
Fish	5.7	6.4	7.0	5.8	4.8	5.2	5.1	4.5	4.3	4.4	4.7	4.7
Wood and timber	3.3	3.8	3.8	2.9	3.3	3.8	3.2	3.2	3.5	4.1	2.5	3.0
Motor cars and trucks	4.4	3.8	3.0	2.6	2.6	3.6	4.2	4.2	4.1	3.7	3.4	1.6
Boots and shoes	3.1	3.8	3.4	4.4	12.8	4.3	2.7	3.6	3.9	3.2	3.9	3.7
Paper	2.1	2.3	2.6	2.9	3.0	3.0	2.9	2.9	3.3	3.2	2.2	3.4
Others	47.6	51.4	51.9	53.0	45.2	50.2	50.0	51.7	49.8	48.1	55.9	56.0

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[1] Listed in order of importance in 1938.

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FOOD SITUATION IN FAR EASTERN AND SOUTHEASTERN ASIA . . . .

By W. Ladejinsky and Fred J. Rossiter*

An examination of the food situation in Far Eastern and Southeastern Asia reveals that, on the whole, these areas are self-sufficient in principal foodstuffs and likely to remain so in the immediate future. Not all the nine countries[1] that make up the two regions produce a sufficient volume of rice, the principal food they consume; Japan proper and British Malaya are countries in point. On the other hand, a number of countries in this group are the largest surplus rice producers in the world (see table 1). Furthermore, the sources of supply of the deficit countries are relatively easy of access, particularly in peacetime.

Rice is the most important food product in all of the countries except North China and Manchuria. Next, in order of importance, are fish, wheat, corn, vegetables, and fruit. Most of the listed countries depend, to some extent, upon imports of certain quantities of wheat flour, animal and dairy products, and a variety of other food products. It must be emphasized, however, that in the main these food imports are essentially luxuries as far as the natives are concerned; financially they are in no position to purchase them, and the imports are consumed by the resident whites and the well-to-do upper strata of the native population. Inability to import such specialized foodstuffs would not lessen the self-sufficiency of these countries even to a small degree, nor would it result in any hardship for their native populations. The decreased fish catch, however, may cause hardship. Practically all of these countries are large fish consumers, and the war will undoubtedly diminish the volume to which they have been accustomed.

TABLE 1.–*Rice production, trade, and utilization, Far Eastern and Southeastern Asia, average 1935-39*

COUNTRY	PRODUCTION	IMPORTS	EXPORTS	APPARENT DOMESTIC UTILIZATION	PERCENTAGE OF SELF-SUFFICIENCY
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Percent*
Japan proper	20,477	86	27	[1] 23,764	[2] 86
Manchuria	941	179	9	1,111	85
China	86,639	1,044	27	87,656	99
Philippine Islands	3,635	117	3	3,749	97
Netherlands Indies[3]	8,875	622	94	9,403	[4] 94
British Malaya	732	1,956	409	2,279	32
French Indochina	10,217	10	3,207	7,020	145
Thailand	7,108	0	3,331	3,777	188
Burma	10,835	2	6,675	4,162	260

[1] Includes 2,196 million pounds imported from Chosen and 1,032 million from Taiwan not included in foreign imports.

[2] Since 1939 Japan's degree of self-sufficiency has been considerably lower.

[3] Java and Madura.

[4] During the past year or two the Netherlands Indies have attained practically complete self-sufficiency.

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* Office of Foreign Agricultural Relations.

[1] Japan, Manchuria, China, Philippines, Netherlands Indies, British Malaya, Burma, Thailand, and French Indochina.

JAPAN

Basic Factors in Japan's Food Situation

The outbreak of the war in Europe caused the belligerent countries to institute very elaborate food-rationing systems in order to utilize most effectively the available food resources, the main reason being that they were not self-sufficient in food supplies. The food situation in Japan during the first 3 years of its war on China was in striking contrast to that of Europe. This was owing to the fact that in the 1930's Japan proper, with the help of its colonies, Chosen and Taiwan, practically achieved self-sufficiency in food. To be sure, Japan proper had no surpluses to dispose of abroad, but neither did it depend on foreign-food imports, as distinguished from colonial food imports, for its basic requirements. Grains, legumes, root and fruit crops, and fish constitute Japan's diet.

Rice is Japan's staple food, and although other grains are also consumed, they supplement rather than replace rice. Normally Japan proper produces about 80 percent of its requirements. Most of the remainder is imported from Japanese colonies, Chosen and Taiwan. On the whole, 99 percent of all rice consumed in Japan proper is supplied from sources within the Japanese Empire.

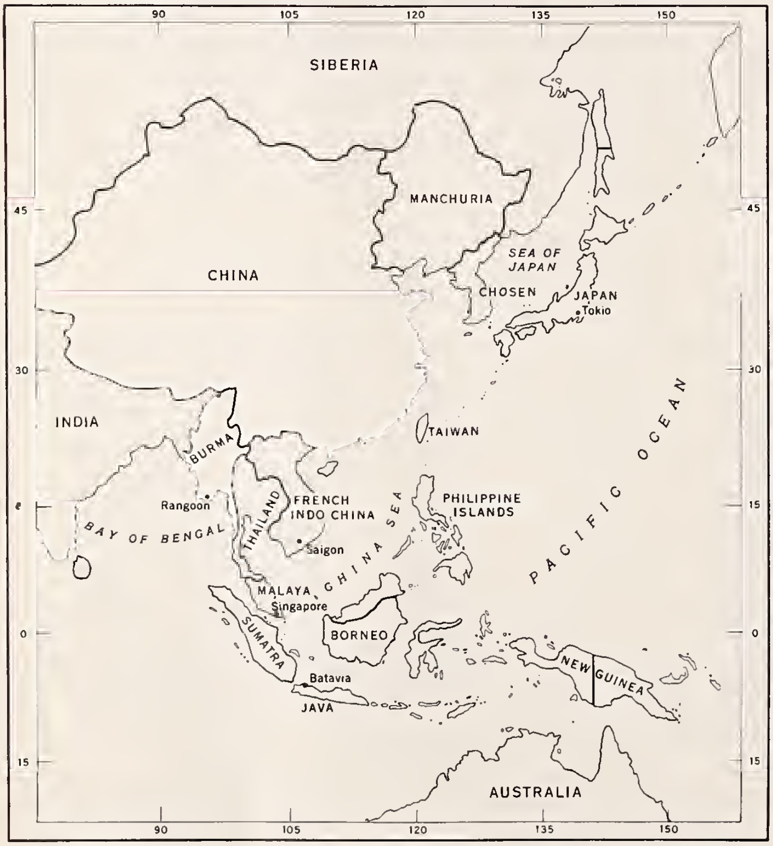

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FIGURE 1.—Far Eastern and Southeastern Asia.

Japan's position is even stronger with respect to wheat and other grains. In the past few years wheat production in Japan has increased to a point where it not only is sufficient for domestic requirements but also leaves a small net exportable surplus. Japan normally imports some wheat, which is blended for producing a high-quality flour for domestic utilization. But in recent years the volume of exported flour in terms of wheat has exceeded that of imported wheat.

Japan is self-sufficient in barley and buckwheat but depends upon imports for 35 percent of its millet and 65 percent of its corn. However, the consumption of the latter two products is small and plays little part in the Japanese diet.

Soybeans are the principal leguminous crop and are used in Japan as a source of both food and fertilizer. Japan produces only 30 percent of its requirements. The remainder is imported from Manchuria (80 percent) and Chosen (20 percent). Manchuria being essentially a Japanese colony, Japan, for all practical purposes, may be said to be self-sufficient in soybeans.

Japan's output of tuber and root crops, vegetables, and fruit is considered quite sufficient for its domestic requirements.

Fish and fish products, rather than meat and dairy products, constitute Japan's most important source of animal protein. While the annual per capita consumption of meat is 4 pounds, of dairy products less than a pound, and of eggs 50, that of fish and fish products is over 100 pounds. Normally, the fish catch of Japan not only is sufficient to satisfy domestic requirements but also furnishes one of the largest items in Japan's export trade. The average annual value of fish exports during 1934-38 was 78 million yen. In 1939 exports reached a record high of 151 million yen.[2]

Measures of Self-Sufficiency

That Japan is practically self-sufficient in foodstuffs is also revealed by the country's foreign trade in food products. Japan's food imports from foreign countries during the period 1930-34 increased by 26 percent and food exports increased 104 percent. Manchuria and China, included among the foreign countries, are Japan's principal sources of food imports. In 1938 they furnished Japan with 82 percent of all its food imports, but even this represented only approximately 2 percent of the total volume of Japanese consumption. Furthermore, limited as this share is, its bulk consisted of soybeans from Manchuria. It may be concluded, therefore, that normally Japan's dependence upon imported foreign foodstuffs is altogether negligible.

Self-sufficiency in foodstuffs is not necessarily synonymous with adequacy of food supply or a high standard of living, but in Japan its attainment has meant a rise in the standard, as witnessed by the per capita consumption of the principal food items over a period of years. Thus rice consumption increased 19 percent, wheat 76 percent, soybeans 17 percent, sugar nearly three times, and fish almost fourfold. Per capita consumption of less important cereals and, to a smaller degree, of potatoes, has declined, whereas consumption of vegetables has expanded. On the whole, the level of food consumption in the Japanese Empire has risen during the course of several decades, even though in the past decade consumption of some of the principal items of the diet has not advanced or has even declined slightly. The conclusion is that, insofar as Japan proper is concerned, the large increase in population has not been accompanied by a lowering of the standard of living and that Japan's self-sufficiency has not been achieved at the expense of the level of consumption.

Reduced to caloric value, the food consumed by the Japanese compares well with that of other countries. The quality of the food, however, measured by western standards, reveals glaring deficiencies. A disproportionate amount of cereals - especially of rice - is consumed in relation to other classes of foods. Less than 4 percent of the caloric intake of a Japanese is of animal origin, as against 30 to 40 percent in Western Europe. A diet of this nature is almost certain to be low in efficient protein, in minerals, and in vitamins. Nevertheless, Japan has perhaps the best balanced diet among Oriental people.

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[2] The average value of the yen for the period 1934-38 was 28.9372 cents.

Recent Developments

Such were the basic features of the Japanese food situation before 1939. But in that year the Japanese Empire harvested one of the poorest rice crops in two decades. The rice crop of Japan proper in 1939 was smaller than that of 1938, and Chosen, Japan's principal colonial rice source, suffered a disastrous crop failure. Taiwan's crop, too, was the smallest in 5 years. Nor were Japan's rice crops in 1940 and 1941 up to normal, chiefly because of inadequate supplies of fertilizers.

It should be pointed out, in this connection, that the huge rise in the Japanese rice output in previous years resulted, for the most part, from a highly intensive cultivation of the soil based on the world's largest per-acre utilization of fertilizers. In recent years there has been a decided shift from vegetable fertilizers, such as soybeans, rapeseed, and cottonseed oil cake, to various chemical fertilizers. Domestic production has, to a large extent, replaced imports because the development of the chemical industry in Japan has led to the substitution of home-produced ammonium sulphate and calcium cyanamide for imported sulphate of ammonia and bean cake. Domestic output might now be adequate were it not for Japan's war activities, which have increased the demand for both fertilizers and explosives, with the latter enjoying priority. And as long as the difficulty in obtaining all the fertilizers needed lasts, the Japanese high yields of the past years will not be maintained. On the whole, the average annual output of rice in the Japanese Empire (1939 and 1940) amounted to 28 billion pounds as against 31 billion pounds during 1936, or a reduction of nearly 10 percent.

Imports to supplement production

Japan is making good its shortage in two ways: by imports of foreign rice and by restriction of domestic consumption. In 1940 Japan imported an estimated total of 4 billion pounds of foreign rice (17 percent of its annual consumption) from Burma, Thailand, French Indochina, and China, and 1.6 billion from Chosen and Taiwan. Japan's output in 1941, estimated at 18 billion pounds plus a carry-over of 7 billion pounds, assured Japan of an excess over the somewhat reduced consumption due to rationing. Should Japanese needs increase, there would be little difficulty in meeting them because French Indochina and Thailand have normally a surplus of about 3 billion pounds each. In addition Japan is in a position to extract from China from 600 to 800 million pounds of rice.

Thus, while Japan has an ample volume of rice for 1942, it is dependent on ability to maintain sea-borne traffic from Chosen, Taiwan, China, Indochina, and Thailand. Interruption of the flow of supplies from the latter two countries in 1942 would undoubtedly affect adversely the food situation of Japan by the summer of 1943 - even though considerable stocks have been accumulated. Failure to maintain imports from Chosen and Taiwan would be disastrous to Japan, since normally one-sixth of the volume of rice consumed in Japan is furnished by the two colonies. On the other hand, the journey from Chosen and Taiwan, especially the former, is so short that the closing of that traffic is quite unlikely. Thus, unless Japan is cut off from the first two sources, it is in a position to obtain the rice needed in case of short crops, caused either by adverse climatic conditions or by shortage of fertilizers.

Restriction of consumption

Restriction of consumption or conservation of supplies has assumed a number of forms in Japan. Rice may be milled now only 70 percent; the use of rice for sake (wine) is restricted; and various restrictions also apply to the use of rice in restaurants. But perhaps the most effective way of meeting the shortage, at the same time conserving rice supplies, is the widespread urban rationing adopted in Japan. In most towns, consumers are allowed to buy about 10 days' supply at one time, since daily purchases would cause undue congestion at retail stores. In Tokyo householders are permitted to buy up to 2 weeks' supply at one time. The amount of rice allotted to each person depends on his age and occupation. The rations are fairly generous, and per capita consumption for the country as a whole is not expected to be reduced by more than 10 percent.

Outlook

The question may be considered now as to the sufficiency of food supplies in Japan in the next year or two. The 1942 and 1943 rice crops of Japan and its colonies are not expected to exceed that of 1941 (29 billion pounds) despite the elaborate Government program to raise output to record levels. The heavy drain on manpower in Japanese villages, the sharp fall in the number of draft animals available, the difficulties in obtaining supplies of fertilizer, the neglect of agricultural improvements because of the wartime demand - all these will undoubtedly tend to reduce the agricultural output. Yet Japan is not likely to suffer from a shortage of rice. Exact information is not available as to the extent to which Japan has been building up stock piles. But with the huge imports of the past 2 years and the introduction of rationing, total supplies have been more than sufficient for consumption. Japan has been concerned not only with the immediate needs, but also with a far-reaching program of building up rice supplies for possible emergencies.

It is estimated that Japan began its rice season (November 1, 1941) with a carry-over of possibly 7 billion pounds, which is nearly three times the normal carry-over. With rationing in force, this year's rice consumption in Japan will amount to approximately 21 billion pounds, or somewhat less than Japan's expected output and imports from the colonies. Under the circumstances, Japan would not have to draw upon its carry-over, let alone upon the available surpluses of French Indochina, Thailand, and China - which could furnish it with another 7 billion pounds of rice. Should the Japanese succeed in overrunning Burma, Japan would be in a position to augment its stocks by another 6 billion pounds. The conclusion is warranted that Japan faces no rice shortage in the rice year November 1941-October 1942, even if it were denied access to French Indochina and Thailand.

Less satisfactory is the Japanese position with respect to fish supplies, although the shortage for domestic consumption may not be serious. The figures on Japan's catch after 1936 are not available, but in that year it amounted to almost

TABLE 2.–*Japanese rice situation, 1940-41, with comparisons*

YEAR	CARRY-OVER BEGINNING OF YEAR	PRODUCTION	IMPORTS				TOTAL SUPPLY	TOTAL EXPORTS	CARRY-OVER AT END OF YEAR	CONSUMPTION		POPULATION
			FOREIGN	CHOSEN	TAIWAN	TOTAL				TOTAL	PER CAPITA	
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Pounds*	*Thousands*
Average:												
1902-3 to 1906-7 ...	-	13,794	1,312	-	189	1,501	15,281	96	-	15,185	324	46,798
1907-8 to 1911-12 ..	-	15,819	513	76	275	834	16,653	123	-	16,529	334	49,477
1912-13 to 1916-17 .	1,640	17,121	447	359	256	1,063	19,457	217	1,731	17,856	337	53,010
1917-18 to 1921-22 .	1,550	18,125	908	768	304	1,981	21,655	135	1,727	19,793	354	55,882
1922-23	2,295	19,067	509	1,085	356	1,950	23,313	222	2,133	20,958	362	57,868
1923-24	2,133	17,418	1,045	1,429	521	2,995	22,546	245	1,637	20,665	352	58,620
1924-25	1,637	17,960	1,614	1,391	792	3,798	23,395	604	1,728	21,063	354	59,428
1925-26	1,728	18,756	673	1,638	687	2,997	23,482	175	1,875	21,432	355	60,341
1926-27	1,875	17,465	1,297	1,855	829	3,980	23,320	409	1,811	21,100	344	61,316
Average above period	1,933	18,133	1,027	1,479	637	3,144	23,211	331	1,837	21,043	353	59,514
1927-28	1,811	19,510	551	2,221	764	3,536	24,857	316	2,463	22,078	355	62,224
1928-29	2,463	18,945	401	1,690	708	2,799	24,207	175	2,208	21,824	346	63,138
1929-30	2,208	18,710	392	1,623	687	2,702	23,621	175	1,797	21,648	338	63,967
1930-31	1,797	21,009	261	2,511	848	3,620	26,426	628	2,871	22,927	354	64,725
1931-32	2,871	17,346	309	2,261	1,074	3,645	23,863	213	2,798	20,821	319	65,366
Average above period	2,230	19,104	383	2,061	816	3,260	24,595	301	2,427	21,859	342	63,884
1932-33	2,798	18,972	314	2,366	1,325	4,005	25,775	196	2,830	22,749	343	66,296
1933-34	2,830	22,251	54	2,813	1,610	4,476	29,557	283	5,162	24,112	359	67,238
1934-35	5,162	16,286	22	2,650	1,417	4,090	25,538	256	3,121	22,161	325	68,194
1935-36	3,121	18,050	129	2,818	1,496	4,443	25,614	176	2,515	22,923	331	69,254
1936-37	2,515	21,155	90	2,116	1,520	3,726	27,396	203	2,360	24,833	353	70,258
Average above period	3,825	19,343	122	2,552	1,473	4,148	26,776	223	3,197	23,355	342	68,248
1937-38	2,360	20,835	47	3,188	1,545	4,780	27,975	184	2,668	25,123	353	71,258
1938-39	2,668	20,687	49	1,787	1,236	3,072	26,427	239	1,276	24,912	345	72,222
1939-40[1]	1,276	19,470	4,115	1,100		5,215	25,961	-	2,311	23,650	-	-
1940-41[1]	2,311	19,155	4,500	3,000		7,500	28,966	-	6,696	22,270	-	-
1941-42[1]	6,696	18,599	-	-		-	-	-	-	-	-	-

[1] Estimates.

Compiled from official sources.

10 billion pounds. Approximately three-fourths of this was consumed domestically and the remainder exported. Almost 15 percent, by value, of all fish caught by Japan came from foreign regions (Soviet and Alaskan waters), while most of the rest came from coastal or territorial waters (off the coasts of Chosen and Taiwan). The supply of fish close to shore seems to have diminished considerably in recent years, and as the demand for fish has been increasing, fishermen have been obliged even in the coastal fisheries to go farther out to sea. That being the case, Japan's catch is bound to diminish at a time when sea warfare is carried on in Japanese waters. It was declining even prior to the outbreak of the Japanese-American hostilities, chiefly because the fishermen were handicapped by the drastic curtailment of fuel for their boats. This curtailment is probably enhanced at the present time, when Japan is compelled to exercise a maximum care in its fuel reserves. There is also the factor of enemy warcraft as a deterrent to Japanese fishing even in its own waters. All this will undoubtedly reduce Japan's catch, but the extent of the decline cannot be foretold.

MANCHURIA

Development Before Japanese Invasion

Manchuria is one of the younger agricultural regions, which prior to the Japanese invasion of 1931 bid fair to play an increasingly important role in the world's agricultural economy. Farming provided the country not only with sufficient food supplies but also with a large exportable surplus. Since the outbreak of the war in Europe, Manchurian exports to that part of the world have been practically wiped out. Since then, too, Manchuria's output of soybeans, the mainstay of the country's agriculture, have suffered a severe decline notwithstanding Japanese efforts to the contrary. The net result is that, while Manchuria still produces sufficient quantities to satisfy domestic requirements, the volume of food exports has declined, and Japan has not been supplied with the volume of foodstuffs it stands ready to take.

The principal food crops of Manchuria are soybeans, kaoliang, millet, corn, and wheat. The first named is the most important one for Manchuria and even more for Japan, where it is used as food, fodder, and fertilizer. In 1930, the year before Japan occupied Manchuria, the latter produced an estimated 197 million bushels, of which it exported almost 100 million bushels in addition to 1.55 million short tons of bean cake and 242 million pounds of bean oil. Wheat, the second most important commercial crop of Manchuria, reached a peak of 58 million bushels in 1931. At the same time the country was importing from 8 to 10 million bushels of wheat in the form of flour and nearly double that amount in the middle of the 1930's, when Manchuria's wheat output suffered a sharp reduction. It would seem, then, that Manchuria is not self-sufficient in wheat. Yet, in time of need Manchuria can adjust itself to a much smaller consumption of wheat by increased utilization of other grains, such as kaoliang, millet, and corn. Manchuria is self-sufficient in these and has an exportable surplus large enough to cover Chosen's usual deficit of kaoliang and millet.

Effect of Japanese Control

Political disturbances, which came in the wake of Japanese aggression, and a number of other factors emanating from them resulted in a 38-percent reduction in soybean output (1934) and a 60-percent reduction in wheat (1934). Somewhat the same, although less severe, was the output reduction of other crops. Between 1935 and 1939 agricultural output increased once again, although it did not attain the preinvasion levels. Beginning in 1939, a new decline in agricultural production set in. This coincided with the establishment of a stringent control over all aspects of Manchurian agricultural economy in order to enable Japan to get a large supply of foodstuffs as soon as possible and for as little as possible. Because of the opposition of the Manchurian farmers to this scheme, the shortage of both human and animal labor, and not altogether favorable climatic conditions - the soybean crop was reduced from 157 million bushels in 1938 to 145 million bushels in 1939 and in 1940 and 1941 to an estimated 125 and 115 million bushels, respectively.

The net effect of reduced production has been a sharp decline in agricultural exports. Prior to 1940 before Japan's control over Manchurian agriculture was imposed, Manchuria had a large surplus of foodstuffs upon which Japan and a number of other countries could rely. Since soybeans and soybean products constitute Manchuria's leading export crop, the exported volume of these products is especially revealing. In 1939-40 (October-September) Manchuria exported 25 million bushels of soybeans, 775,000 short tons of bean cake, and 150 million pounds of bean oil, as compared with 77 million bushels, 1.1 million short tons, and 220 million pounds of soybeans, cake, and oil, respectively, the previous year.

This decline in Manchurian soybean exports affected Japan's food supplies adversely. Aside from the direct use of soybeans for food, probably the most important soybean product from the viewpoint of diet is bean curd, one of the main sources of protein for the great majority of the Japanese urban population. In 1939-40 Japan was able to get 41 million bushels of soybeans (including cake and meal), against 58 million the previous year. In 1940-41 Japan increased its soybean takings to 48 million bushels, but it was much below the planned record import volume of 84 million bushels. The 1941-42 crop in Manchuria of approximately 115 million bushels is the smallest in 15 years, and domestic consumption is expected to reach a record high because of the poor Manchurian wheat output and the difficulty of obtaining wheat flour from other sources, as well as the farmers' unwillingness to sell at the low official prices offered them. As the total Manchurian domestic utilization is estimated at about 75 million bushels, Japan will have to be content with a maximum of 40 million bushels.

While such a volume may have been sufficient in peacetime, when Japan's fish catch provided the country with adequate quantities of animal protein, it is clearly insufficient now in conditions of a much diminished fish supply. In addition, the problem of fertilizers in Japan during wartime assumes more serious proportions, as an increasing part of the chemicals for fertilizers is used for war purposes. Japan will have to revert once more to the greater utilization of bean cake as a fertilizer. For the reasons stated above, Japan's need for soybeans and bean cake as sources of protein and fertilizers is unquestionably greater than the estimated volume it will get in 1941-42. And the requirements will undoubtedly rise as the war continues.

Outlook

The situation in 1942-43 may be more favorable to Japan if its policy of obtaining large supplies of Manchurian soybeans at a minimum cost is reversed. This means that Japan would have not only to offer the farmers higher prices but to supply them with manufactured goods at reasonable prices. It is doubtful, however, if Japan is in a position to supply them with a fair volume of such commodities. In the past 3 years Manchuria has not been able to get nearly enough goods from Japan. The chances of getting them now or in the immediate future are even less promising. It is fair to assume, therefore, that the Manchurian farmers will tend to limit their output to their own needs, and Japan will hardly be able to get all the soybeans and soybean products wanted at a time when it needs them most. To this inability must be added the possible indirect effect of Manchuria's shortage of wheat on Japan's food supply. The increased domestic consumption of millet and kaoliang in place of wheat in Manchuria will not permit the exportation of these products to Chosen in volumes as large as in the past. For this reason Chosen may not be in a position to spare a corresponding proportion of its rice crop for exportation to Japan.

TABLE 3.–*Production of soybeans, wheat, corn, millet, and kaoliang in Manchuria, 1931-40*

YEAR	SOYBEANS	WHEAT	CORN	MILLET	KAOLIANG
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 short tons*
1931	192,058	58,066	67,166	130,512	4,957
1932	156,817	41,634	60,699	115,301	4,110
1933	169,056	31,726	69,243	140,389	4,433
1934	122,973	23,463	57,871	93,828	3,825
1935	141,793	37,312	74,917	130,865	4,523
1936	152,375	35,235	84,483	140,521	4,675
1937	159,907	41,373	88,184	142,241	4,756
1938	157,447	34,318	90,507	140,257	5,099
1939	144,952	31,232	91,561	134,272	4,964
1940	[1] 117,579	27,558	110,230	-	-

[1] Preliminary.

CHINA

The food supplies of both occupied and free China are below normal requirements. Production of major crops in 1940 and 1941 was slightly under average; marketing facilities continue to be badly disrupted and distribution inadequate. In addition, vital agricultural supplies have been taken out of the country to Japan.

Imports of foodstuffs, which have been in fairly large quantities despite the Sino-Japanese conflict, will undoubtedly be insignificant in 1942. Present stocks plus regular harvests, although inadequate, will sustain most of the population. Suffering among the poor, however, will be widespread in both occupied and free China.

The volume of production in 1942 will be dependent primarily upon climatic conditions. External factors, such as the use of imported commercial fertilizers and other imported supplies, do not influence crop production in China. Because of the uncertain value of money, farmers of all regions will continue to reduce cash crops and grow food and fibers needed for domestic consumption. If weather conditions are normal, crop production should be fairly adequate. However, during periods of political and economic strain, when governments are unable to look after the repairing of dikes and canals, the possibility of crop losses from flood and drought increase, and this may prove to be a factor in decreasing production in China as long as the present conditions exist. Although Japan has been obtaining rice, wheat, cotton, and vegetable oilseeds during the past 2 or 3 years, it is doubtful whether greater pressure can extract increased food supplies from China, as experience has proven such pressure unsuccessful in Manchuria.

Prices are phenomenally high in all parts of China on account of inflation. All metal currency has long disappeared and "printing press" money is cheap. Some hoarding of agricultural supplies exists, but the necessities of life are extremely high, and poor people in the cities are having a difficult struggle. The degree of self-sufficiency among country people has materially increased.

The undefined boundaries between occupied and free China have changed relatively little during the past 3 years. Japanese authorities and the National Government of China prohibit the flow of goods between the two areas. The restriction is fairly effective along all main routes of transportation.

TABLE 4.–*Production of rice, wheat, soybeans, and sweetpotatoes in China, 1931-41*

YEAR	RICE	WHEAT	SOYBEANS	SWEETPOTATOES
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*Million bushels*
1931	2,263,203	794,317	210,040	634
1932	2,574,436	835,147	240,688	722
1933	2,518,368	827,757	267,178	736
1934	2,026,287	825,277	207,401	642
1935	2,493,610	782,729	184,415	744
1936	2,492,398	847,952	215,728	758
1937	2,716,713	636,450	213,189	-
1938	2,812,089	640,000	207,600	-
1939	2,602,106	667,000	203,900	-
1940	2,252,459	700,000	[1] 216,800	-
1941	2,327,000	720,000	-	-

[1] Preliminary.

Occupied China

Occupied China consists of North China, the lower and central Yangtze Valley, and all the ports of South China. The area produces about four-fifths of China's wheat and one-fourth of its rice. The diet of the North China people consists of wheat, millet, kaoliang, corn, sweetpotatoes, and beans, and that in the Yangtze Valley primarily of rice, wheat, sweetpotatoes, and beans.

Normally the area is about self-sufficient in food, having a surplus of rice and importing a small quantity of wheat and wheat flour. At the present time total food supplies are slightly larger than they were 2 or 3 years ago. Rural food stocks in most sections are adequate, but supplies in the cities and quantities likely to be available for cities are probably below normal.

It is from this area that the Japanese have been obtaining annually from 300,000 to 700,000 short tons of rice; vegetable oilseeds, such as peanuts, cottonseed, and rapeseed; and small quantities of wheat.

Free China

Free China consists of South China almost to the Yangtze River - minus the ports - and West China. Rice is the outstanding crop and food, followed by sweetpotatoes and beans. In food the area normally is almost self-sufficient. South China imports a small proportion of its rice requirements, some vegetable oil, and a rather large percentage of the relatively small consumption of wheat flour.

Food supplies in many parts of free China are now below normal requirements because the 1941 rice harvest, plus the carry-over, was slightly under average. Until 1940 food supplies in most of the area were ample on account of three bountiful rice crops (1937-39). The food situation at the present time, however, is serious. The increased demands for military forces and the almost prohibitive cost of imports create a difficult problem. The only accessible source of imports is Burma, where available stocks are ample but must be hauled by trucks over the Burma Road in competition with urgent military supplies. Under present conditions it will be necessary for the Chinese people to reduce further their standard of living by using more sweetpotatoes and vegetables. One favorable aspect of the situation is that the climate is suitable for growing food from 9 to 12 months of the year, which prevents widespread famine. If weather conditions in 1942 and 1943 are normal for crop production, the food situation should be no more critical than at the present time.

PHILIPPINE ISLANDS

The Philippines maintain a favorable balance of trade in foodstuffs, but they are not fully self-sufficient in this respect. They produce such large surpluses of sugar and coconuts as to enable them to pay for the imports of a great variety of foods in relatively small quantities. In 1940 food products constituted 16 percent of the total Philippine imports. It may be noted, however, that of the 75 or more imported food items only evaporated and condensed milk, wheat flour, rice, oranges, and coffee entered in fairly large quantities. The volume of rice imported represents only 2 or 3 percent of the total consumption. There is also reason to believe that most of the imported food is consumed in urban centers, particularly in Manila. In an emergency the Philippine food output could be increased without difficulty to meet all the basic requirements of the population. Some imported food items would undoubtedly be missed, but such a lack would not result in a food shortage that would cause any serious distress.

The chief foods of the Philippines are rice, fish, coconuts, corn, sugar, cacao, sweetpotatoes, and coffee. About three-fourths of the population eat rice; the rest consume much corn and, in the urban centers, wheat bread and other bakery products. The per capita consumption of rice averages about 187 pounds, and only in times of acute economic distress will the people resort to cheaper substitutes. The area planted to rice is approximately half that of the total crop area, and about half of the total investment in all agricultural industries is in rice. The output of rice has increased over a period of years, averaging 3.1 billion pounds in 1936-40. This volume is not quite sufficient to cover domestic requirements, but the deficit in the past 2 years represented only approximately 2 to 3 percent of consumption.

Next to rice, corn is the most important food crop for domestic consumption, being preferred to rice in Cebu, Oriental Negros, Bohol, and sections of some other islands. Present production is sufficient to meet the demand. Very little wheat is grown in the Philippines, since the climate is not well adapted to its production, but the demand for it is found in urban centers. Large quantities of wheat flour have been imported for several years, increasing with American occupation. In 1940 the Philippines imported 4.5 million bags of wheat flour, imports accounting for most of the consumption.

In most other food items the Philippines are practically self-sufficient. Among the animal products fish is the principal food of the Filipino people. The yearly catch is estimated at over 2 billion pounds, or a per capita consumption of about 125 pounds, which is perhaps the highest in the world. Normally, the Philippines are practically self-sufficient in this very important food item, for imports account for only 2 percent of the total consumption.

In summary, if the Philippines were completely cut off from other sources of food supplies, they could produce the necessary volume of basic foodstuffs from domestic sources. To be sure, the variety of food enjoyed by certain sections of the population in urban centers would be reduced to a minimum or would disappear altogether. On the other hand, in conditions of actual warfare as carried on now in and about the Philippines, the islands, while generally self-sufficient, will suffer serious shortages of the food to which the population has been accustomed. The extent of the shortages will depend upon the nature and length of the war in the Philippines.

NETHERLANDS INDIES

Unlike British Malaya with its 5.5 million people, the Netherlands Indies with its 70 million people is much better provided with home-grown food. With but one exception, fish, the Indies can produce enough food in 1942 to meet the requirements of the native population. This includes rice, the staple food of the Indies. Until very recently the islands had to import a considerable volume of rice to cover the yearly shortage, but by 1940 approximately 98 percent of all the rice consumed was produced domestically. Furnishing food for the resident white population, which may be estimated now at about 300,000, is a more difficult problem since in the past it depended to a large extent upon imported food from western countries. In the light of present developments, the adjustment to native food - already in process for over a year - will be accelerated in the forthcoming year.

Although rice is the main food staple of the Netherlands Indies, other food crops are also very important. Corn, for instance, is the basic diet in eastern Java. Cassava, potatoes, peanuts, soybeans, and other beans figure prominently as food items. Besides these, the natives consume fish, sugar, coffee, copra, and fruit, but practically no meat or dairy products. Besides such export crops as sugar and coffee, corn is also on an export basis.

The rapid increase in population in Java has brought to the fore the problem of a sufficient rice supply. Since it is the staple diet, the Government has made a successful effort to stimulate its production. The expansion of the rice acreage and output was most pronounced in the past few years, reaching a peak in 1940 with 15.6 billion pounds. This is reflected in the reduced volume of imports, over 50 percent of which came from Thailand and French Indochina and the remainder from Burma. During the years 1926-30 the East Indies ranked third as a rice importer, the yearly average net imports amounting to 1,300 million pounds. However, imports declined to 520 million pounds during the years 1935-39, or to less than 3 percent of the total consumption. The volume would have been even smaller but for the action on the part of the Government in building up reserve stocks.

To appreciate more fully how the Netherlands Indies is meeting the rice situation in 1942 a distinction must be made between Java and Madura, with a population of 48 million, and the Outer Islands (Sumatra, Borneo, Celebes, and the Lesser Sunda Islands), with a population of 22 million. Prior to 1936 Java's rice production could not meet its consumption requirements; since that year Java has succeeded in raising its output to a point where it not only is sufficient to meet domestic requirements but leaves also an exportable surplus for the Outer Islands. In the Outer Islands, too, production has risen somewhat, but imports still furnish 8 percent of consumption. In time of emergency even this shortage can be overcome. Prior to the outbreak of the present war the native farmers of the Outer Islands preferred to engage chiefly in the cultivation of the more profitable export crops, such as rubber, copra, and coffee; food crops were of secondary importance. Now, however, with the decline - if not outright stoppage - of exports, the farmers concentrate more on food crops. Should the increase in the output of food crops fall short of requirements, there is available a surplus of about 2 million bushels of Javanese corn, which was normally exported to Japan.

Java's rice surplus can also be increased and shipped to the Outer Islands by putting some of the land now under sugarcane into rice. Under present conditions, sugar exports and sugarcane acreage will dwindle to a very low point and rice will be substituted for cane.

Immediately upon the outbreak of the war the Government of the Netherlands Indies enacted a compulsory-cultivation ordinance (September 9, 1939). This measure enabled the administration to require all plantation owners to use their wasteland for the cultivation of specified food crops. According to one provision of the ordinance, the plantations must maintain rice stocks sufficient to support their laborers and families for the several months of the nonharvesting season and must keep supplies of seed rice. The plantation owners are encouraged also to set aside small plots of land for the raising of food crops by the workers employed there. It is clear that the purpose of this measure was to compel the planters to produce enough food to support their own native population.

The one weak element in the food situation of the Netherlands Indies is the supply of fish. The latter is an important item of the native diet. Part of the supply, approximately 150 million pounds, is normally imported from Singapore. Data concerning the size of the catch in the Netherlands Indies are not available, but it seems obvious that, whatever the pre-war volume, the population will have to do with much less. Imports from Singapore are impossible, and the 1942 catch in the waters of the entire archipelago will be materially reduced - if not wiped out - for as long a time as the Japanese naval and air attacks persist. But aside from fish, the Netherlands Indies is in a position to produce enough food in this and the year to come.

BRITISH MALAYA

Among all the countries of Eastern Asia, British Malaya is the least self-sufficient in food supplies. Normally, approximately two-thirds of the rice consumed in Malaya is imported. The food situation in 1942 is likely to be a grave one indeed. Rice from Thailand constitutes two-thirds of Malaya's imports. Burma's surplus production could make good the remaining deficit if the sea lanes between the two countries were kept open.

The difficult food situation in British Malaya may be explained by the manner in which Malay's 5 million acres are exploited. Of the 16 recorded crops, rubber alone accounts for 66 percent of all the cultivated land. The utilization of so much land for rubber has had a very detrimental effect upon the country's food supply. Many natives have been neglecting or reducing considerably their acreage under rice, Malaya's principal food, to plant rubber trees. Thus the rice acreage is only 12 percent of the total, and the acreage under coconuts, the second important food crop, is 14 percent of the total. The remaining 8 percent of the cultivated land is taken up by 13 other crops, which add relatively little to the country's food supplies. The net result is that British Malaya, with a population of slightly over 5 million people and a cultivated area of practically as many acres, produces only slightly more than one-third of its food requirements - or rice and fish requirements, since domestic production of coconuts and of the few minor supplementary crops is sufficient for domestic needs.

As in practically all eastern Asiatic countries, rice is Malaya's staff of life. The peasantry and laboring classes subsist almost entirely on this food, and, although among the upper and middle classes other foods are added, rice remains the staple diet of all classes. Moreover, Malaya shows no tendency to substitute other grains for rice, as do a number of rice-consuming countries. The annual per capita production in Malaya is only 145 pounds, whereas the per capita consumption is about 350 pounds. The total consumption in 1940 was estimated at about 2.1 billion pounds as against an output of 750 million pounds.

To make good the deficit, Malaya relies upon imports, chiefly from Thailand and Burma. In 1940 net imports were estimated at 1.8 billion pounds, thus leaving a carry-over of 500 million pounds. In 1939 Thailand provided 68 percent of Malaya's total imports, Burma 25 percent, and French Indochina 5 percent.

With the outbreak of the European war and the threat of a Japanese-British conflict, the question of rice self-sufficiency became pressing, since any disruption of the sources of supply may precipitate a grave crisis and even famine. The Government of Malaya has undertaken a number of measures with a view to increasing the rice output. Such measures could not, however, reduce the deficit materially, and heavy imports of rice still remain the only recourse. Because of the 1940 carry-over of 500 million pounds, normal domestic production of 750 million pounds, and probable imports amounting to 1.7 billion pounds, Malaya probably closed the year 1941 with one of the biggest stock piles of rice on record, namely 700 million pounds.

Now that British Malaya has fallen into the hands of Japan, the former will continue to have access to Thailand rice; the access to Burmese rice is at the present time questionable. But to satisfy Malaya's 1942 requirements, the country does not have to depend on Burma, although in the past Burma furnished Malaya one-third of its imports. British Malaya's 1941 carry-over of 700 million pounds, plus an expected crop of 750 million pounds in 1942, would fall short of the country's requirements by some 800 million pounds. Thailand with a carry-over of 5 billion pounds at the end of 1941 could easily cover not only Malaya's shortage but also the requirements of other deficit areas now under Japanese control.

Fish is, for the most part, the only animal food consumed in Malaya. The annual catch amounts to approximately 225 million pounds, or 45 pounds per capita. A great deal of the fishing industry was in the hands of the Japanese, and much of it was done a thousand miles offshore. Under the present circumstances the Malayan people will undoubtedly suffer a severe shortage of fish supplies, which will aggravate the already serious food problem.

FRENCH INDOCHINA, THAILAND, AND BURMA

French Indochina, Thailand, and Burma are in a class by themselves, for they are the Big Three of the Asiatic surplus-producing countries. Their surpluses consist almost entirely of rice and constitute approximately 95 percent of all the rice that enters international trade. The National economy of the three countries depends largely upon the production and exports of rice. Favorable climatic conditions, fertile soil, and cheap labor are the chief advantages these countries have in producing rice. Furthermore, because of the low standard of living, the majority of the people are compelled to live almost entirely on the food they can produce, and the main staple, of course, is rice. Imports of foodstuffs into these countries are small, consisting of items they can easily do without in an emergency.

French Indochina

Indochina is fully self-sufficient in food supplies. The country's surplus of its basic food staple, rice, is so large that even a crop failure in a given year could not deprive it of a volume large enough to meet domestic requirements. A review of Indochina's foreign trade shows that exports of food products constitute more than four-fifths of the total as against food imports representing about 10 percent of all the import trade. Import-export figures indicate that Indochina will be well provided with food even if all imports are cut off.

Food production and consumption in Indochina may be roughly divided into three categories. The first consists of rice, dried fish, and corn, of which there is normally a large enough output for domestic consumption as well as a great surplus for export. The second category is made up of vegetables, spices, tea and coffee, and meat. Their output exceeds domestic consumption, but the surplus is relatively small. If the supply of any of these items were materially reduced temporarily, the shortage would exercise little hardship on the consumers. The third group includes those foods of which there is practically no indigenous production and for which Indochina is dependent on imports from other countries. These are chiefly dairy products, wheat, sugar, and wines. Most of these imports are intended for the well-to-do groups of the urban centers; the great majority of the native population consume little of these.

What really makes Indochina a great source of surplus food is the volume of rice output. Rice is the outstanding factor in the national economy of the country, national income depending largely on returns derived from rice exports. On an average, about 30 percent of production is exported annually, and rice alone constitutes about 70 percent of the value of total exports. The 1940 crop was estimated at 10 billion pounds and exports at 3.5 billion pounds. The 1941 exportable surplus was estimated at 3.3 billion pounds. Data concerning the crop harvested in the fall of 1941 are not available, but, weather conditions having been normal, it is fair to assume that the rice output was as large as in 1940. The surplus available for export might not be as large as in the previous years, since a somewhat larger quantity of rice will be consumed domestically in 1942 as a substitute for some of the products that will not be imported. However, the surplus available for export will hardly fall below 3 billion pounds. In addition to this surplus, Indochina is a surplus producer of corn; in 1939 and 1940 exports amounted to 17 and 11 million bushels, respectively. As in any other country in southeastern Asia, Indochina's fish catch will be severely affected in wartime, but its extent cannot be gaged at this point.

Thailand (Siam)

What is true of Indochina applies with even greater force to Thailand. The basis of the diet of the Siamese is rice, which, incidentally, is also fed to domestic animals. Fish is a staple food; vegetables and fruit are eaten daily, but meat and eggs are consumed very rarely. Many in Thailand drink tea, but no coffee or fresh milk is drunk by the natives. Imported foods, which serve the needs of the very few rather than the many, play a small role in the diet. They consist primarily of canned milk, canned vegetables, wheat flour, sugar, and a few miscellaneous items.

Rice, then, is not only the main food staple but the country's biggest crop and the very basis of its economy. Approximately 90 percent of the total arable land is devoted to rice production, and normally between 40 and 50 percent of the rice produced is exported. The 1939 output was 7.5 billion pounds, of which 4 billion pounds was exported. Production figures for the subsequent years have not been made public. However, the 1940 crop was reported to be below normal, and 1941 exports were roughly estimated at 2.8 billion pounds. The excellent crop of 1941 and the available carryover may place Thailand's rice available for export in 1942 at as high a figure as 5 billion pounds. Barring a total crop failure, there can be no question of a food shortage in Thailand. There is likely to be a shortage of fish, but even that would not change materially the food situation in Thailand, as long as rice production is maintained at satisfactory levels.

Burma

Burma, too, may be said to be self-sufficient in food, even though about 15 percent of all imports consist of foodstuffs. The native diet is made up chiefly of rice, fish, and vegetables, and sesame oil is commonly used in cooking. In addition, condensed milk, wheat flour, fish, fruit and nuts, tea, and sugar are imported. Such goods, however, are in most cases luxuries to the majority of the natives of Burma.

The basic food is rice, and this they have in great abundance despite the fact that the Burmese people are among the world's heaviest rice consumers, averaging about 350 pounds per capita annually. Nearly 71 percent of the sown area (18 million acres) is under rice (12.8 million acres). The normal rice output amounts to almost 10 billion pounds and the exportable surplus is more than those of its nearest rivals, Thailand and Indochina, combined. The annual average volume of exports during the years 1938-40 amounted to 6.4 billion pounds. In the first 11 months of 1941 exports were 7 billion pounds, or 20 percent larger than those of the corresponding period in 1940. The 1941 crop was slightly below the bumper crop of 1940, but the exportable surplus will not be smaller than in recent years. The problem confronting Burma is one of disposal of the surplus, since about half of it formerly went to countries that are not now accessible. With the loss of Rangoon fully three-fourths of the exportable surplus will be cut off from the Allied Nations.

Data concerning fish consumption in Burma are not available, but imports are not large; they represent about 2 pounds per capita. Burma is on an import basis as far as wheat flour is concerned, but it accounts for only about 2 percent of all the wheat consumed. More serious is the sugar situation, since a considerable quantity (16,000 short tons) is imported from Java. Burma also has a deficit in fruits and vegetables and particularly in dairy products. The complete lack of such imports - if necessary - would not be a primary factor in the food self-sufficiency of Burma. The adjustment to changed conditions would have to be made only by a small segment of the population. As long as Burma continues to produce rice and vegetables and the fish catch is not materially reduced, the Burmese people will suffer no shortage of basic foodstuffs. It is important to note also that with respect to a number of imported food items Burma is in a better position than some of the other countries discussed. With the chief exception of some dairy products from Europe and sugar from Java, most of the enumerated food imports come from neighboring India.

SUMMARY AND CONCLUSIONS

Japan

Normally Japan is practically self-sufficient in foodstuffs. Its dependence upon foreign food imports, as distinguished from imports from its colonies, is negligible. Japan is a deficit producer of rice and soybeans, but most of the shortage is made good by Japanese colonies, Chosen, Taiwan, and Manchuria. Short crops in the past 2 years in both Japan and the colonies compelled it to import large quantities of rice from Burma, Thailand, French Indochina, and China. Should imports be necessary in 1942, Japan could get them from Thailand's and French Indochina's surplus of rice, which are estimated at 5 and 3.3 billion pounds, respectively. Availability of this rice, Japan's own output, imports from its colonies, and conservation of rice through rationing will provide Japan with a volume of rice considerably above that of its requirements for domestic consumption. Japan is likely to experience a shortage of fish, but its extent cannot be estimated, depending as it does upon the availability of fuel for fishing boats and the activities of enemy navy and aircraft in Japanese waters.

Manchuria

Manchuria is self-sufficient in foodstuffs, even though it is a deficit wheat producer. In time of need Manchuria can adjust itself to a much smaller consumption of wheat by increased utilization of other grains, of which it enjoys a surplus. For reasons indicated elsewhere, Manchuria's agricultural output has suffered a decline in the past 2 years. The result is that Japan is getting fewer soybeans than it would like to have. Meanwhile, Manchuria's output of foodstuffs, though reduced, is sufficient to meet domestic requirements.

China

Present stocks plus normal harvests in occupied and free China, although inadequate, will sustain the needs of most of the population. Because of the uncertain value of money, farmers of all regions will continue to reduce cash crops and grow food needed for domestic consumption. The volume of the output in 1942 will depend primarily upon weather conditions.

Philippine Islands

The Philippines are almost self-sufficient in food, although they depend upon a small quantity of a large variety of imported foodstuffs. The chief foods of the islands, rice, fish, corn, coconuts, sugar, and sweetpotatoes, are produced domestically, although 3 percent of the rice consumed is imported. Some imported foods would be missed, but such a lack would not result in a food shortage that would cause serious distress to the native population.

Netherlands Indies

With but one exception, fish, the Indies can produce enough food in 1942 to meet the requirements of the native population. This includes rice, the staple food of the Indies. The white population of about 300,000 formerly depended to a large extent upon imported foodstuffs. Under the prevailing circumstances it will have to adjust itself to native foods.

British Malaya

Of all the Asiatic countries British Malaya is farthest from self-sufficiency in food; it depends upon imports for two-thirds of its rice requirements. To make good the deficit Malaya relies upon imports, chiefly from Thailand and Burma. At the present time its access to Siamese rice (two-thirds of all imports) is assured, but imports from Burma are in jeopardy.

French Indochina, Thailand, and Burma

The Big Three Asiatic surplus-producing countries, because of their huge rice surpluses, furnish approximately 95 percent of all the rice that enters world trade. Exports of rice from Indochina, Thailand, and Burma in 1941 were estimated at 3, 2.8, and 6.8 billion pounds, respectively. Imports of foodstuffs into these countries are small, consisting of items that can easily be dispensed with in an emergency.

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